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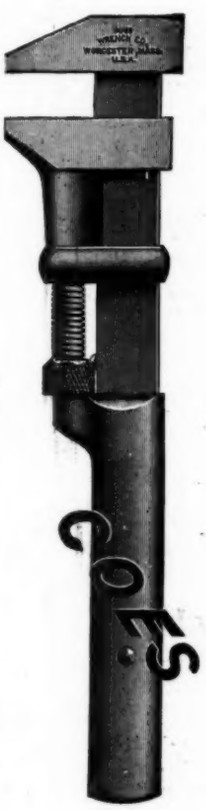

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out of the twenty-five thousand furnace dealers in the U. S. A.

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SOME people who ought to know tell me that, as a class, furnace installers are not progressive, that they are not willing to make a real effort to get more than a mere living out of their business. If you are one of them

You Are Not the Man I'm Talking To

THE right dealer who will act on this idea of mine—without any risk to him—can in one year make more profit out of his furnace business than he ever made.

Only Fifty Real Furnace Merchants

can get in on this proposition of mine and they have to be real merchants besides knowing the installation game. All I have to sell is as good a cast furnace as can be made at a fair price, but I can make and sell it to the real furnace merchant at a price that will yield him considerably more than he can make on any similar furnace.

If you feel that you are the kind of man who can sell at least one hundred furnaces a year, you and I have something in common and I'll be glad to tell you my whole story and prove what I have said is true.

If you really know the furnace game and have gumption enough to grasp an opportunity, you will find it worth while to write for full information to BOX A, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. Their editor knows me and knows that what I claim here is true.

Founded 1880 by Daniel Stern

Thoroughly Covers the Hardware, Stove, Sheet Metal, and Warm Air Heating and Ventilating Interests

AMERICAN ARTISAN and Hardware Record

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THE HARD COAL SITUATION AND WHAT IT MEANS TO THE FURNACE INDUSTRY.

For several years the owners and workers of hard coal mines have been quarreling about various matters about which the general public is only interested in a secondary manner. We knew that whatever the settlement was we would have to pay more for anthracite.

After the experience of 1922, there is, however, a different attitude among the public in the sections where hard coal has been the principal fuel for residence heating.

Last year many people suffered hardships because of the failure of agreement between owners and mine workers; they thought that hard coal was the only fuel that could be used to advantage, and they were not equipped to burn soft coal, it was believed.

There has, however, been a very active, although quiet, campaign of education carried on in the East, and today many residences are equipped with furnaces in which ordinary soft or bituminous coal may be burned with good results.

Several manufacturers now produce types of warm air furnaces which not only can be fired with soft coal but which actually make use of the gases, which formerly went up in shape of black smoke and soot, to generate heat and which to all intents are practically smokeless.

Another fallacy has been exploded about the soft coal: For many years the general idea among the "common" people was that one could not keep a soft coal fire over night.

Nowadays soft coal fires are banked just as effectively and advantageously as those of hard coal.

So far as cost of fuel is concerned, soft coal has the advantage over hard coal.

And with regard to the life of the furnace —there is no longer any question among people who really know, that a soft coal fire, properly operated, does not injure any part of the furnace any more than one of hard coal.

What has all this to do with the furnace manufacturers and installers?

Nothing, except that this quarrel between the mine owners and workers gives them a golden opportunity to put in some very effective work—in which they certainly will have the cooperation of the operators and sellers of soft and bituminous coal.

And by going after the business in soft coal furnaces now with vim and vigor, both furnace manufacturers and local installers will not only reap results in a financial way, but will also render a very real service to the people in the Eastern states and in other sections, where anthracite coal has formerly been the principal fuel for residence heating.

But there is no time to lose.

The time for work is right now.

The harvest is on, and fall is fast approaching.

September, October and November can be made your most profitable months.

Random Notes and Sketches.

By Sidney Arnold

Out in Aurora, Illinois, where Jack Stowall has built up a successful sheet metal business, they have grouches and other nuisances. Jack tells the following story:

It had been years, according to neighboring gossip, since the town grouch had uttered a word except to his dog and his banker. If a spark of sociability and kindness existed in him, it was said, it was for the dog. So when the animal appeared one day minus its tail, the banker was nominated to find out what the trouble was.

"What's happened to your dog's tail?" he inquired.

"Chopped it off," growled the grouch. "He was always waggin' it at somebody."

* * *

Luck and destiny are often blamed for the failure of some persons, particularly when the person in question is doing the blaming, as in the following story, contributed by Blair Quick, who sells furnaces in Des Moines:

Misto Johnsing was before the court for the third time charged with crap shooting.

"Sam," said the judge kindly, but with a touch of exasperation, "I don't know what you'll ever amount to. Don't you know that every man holds his destiny right in his own hand?"

"Ah knows it, jedge," replied Sam mournfully, absent-mindedly fingering the speckled cubes, "but Ah's jes' had rotten luck."

* * *

August Luedke, of the Milwaukee Corrugating Company, was a juror in a case recently when the following incident occurred:

A witness was being examined by the counsel for the plaintiff. This chap was strangely reserved, and the lawyer had a time with him.

"What do you do?" asked the cross-examiner, when the witness was handed over to him.

"I am quite well," was the unexpected reply.

"I am not enquiring as to your health. What I want to know is, What do you do?"

"I work."

"And where do you work?"

"In a factory."

"May I," the lawyer continued, with a fine show of sarcasm, "so far presume as to ask what kind of a factory?"

"Rather a large factory."

"See here, you are too facetious. What do you make in the factory?"

"You want to know what I make in the factory?"

"Precisely, and without any further circumlocution."

"I make $25 a week."

* * *

Charlie Gohmann, who makes "Pointer" ranges, sends me the following story with permission to publish it:

A nervous wreck consulted his physician about his troubles. The doctor asked numerous questions about drinking, diet, etc. He seemed to be particular about the quantity of coffee the patient consumed daily, receiving the reply, "ten saucers."

"You should not drink from a saucer; use a cup," the doctor advised.

"I would," was the answer, "but I am afraid that I'll run the spoon in my eye."

I am inclined to believe that this story is as true as it is old, for while I was in the service I found many a New Albanian—Charlie's neighbors, you know—having the same trouble.

* * *

Harry C. Knisely, President of the Chicago Sheet Metal Contractors' Association, had a young fellow apply to him for a job; the young man being rather of the never-do-well variety, but a son of one of his best friends, recently passed on to his reward.

"We-ell, maybe I could give you a job as a timekeeper," Harry remarked doubtfully, "but you will have to be on the job promptly and tend to your business."

"Why—why—I'm much obliged, but the fact is, the pawnbroker's got my watch," stammered the young prodigal.

* * *

"Discretion is the better part of valor," and "He who fights and runs away may live to fight another day," are two sayings that have a lot of good sense in them, as illustrated by the following colloquy, sent me by Fred Nesbit, of the Standard Furnace & Supply Company:

Judge—"But how can you prove to this court that your husband wilfully deserted you and made himself absent for the period of time you mention?"

Mrs. Halloran—"Sure, an' ain't he the sly one, to know it's the beatin' of his life he'd a' got if he didn't."

I don't know why Fred sent that bit of humor to me, for certainly he is not of the kind that runs away from a fight, and he knows that if there is anything that I like better than a good scrap it is two good scraps.

* * *

R. L. Shugg, Secretary of the Ohio Sheet Metal Auxiliary, was out riding the other day with a married friend of his, who had the rest of the family along.

There had been a blowout, and the father of the family was perspiringly and profanely changing tires.

"I don't see why you have to talk that way," said his wife, reproachfully. "You act as if it were a total loss. You never see the good in things."

"Well, what good is there in this?"

"Why, it tickled the baby so. He laughed right out loud when it went bang!"

Which just goes to show that no matter how bad things may seem, there is always some bit of silver lining behind the clouds.

Dr. Palmer Discusses Modern Tendencies of Ventilation Practice.

Detroit Health Official Traces Development of Ventilating Apparatus During Past Fifty Years

ON PAGES 15 to 18 of our August 18th issue is the second of a series of three articles which embody the speech on fifty years of ventilating practices by Dr. George T. Palmer, Epidemiologist for the Department of Health, delivered at the annual meeting of the American Society of Heating and Ventilating Engineers.

The following article is the third and last of the series and concerns itself chiefly with the deficiencies of the existing laws on ventilation and with present day ventilating needs.

Deficiencies in Existing Laws and Enactments on Ventilation.

How do existing statutes and regulations conform to this definition?

They differ primarily in the air supply standard. The New York State law passed in 1904 recites that the "Commissioner of Education shall not approve any plans for the erection of any school building in third class cities or incorporated villages or school districts, the cost of which building or addition exceeds $500, unless provision is made therein for assuring at least 30 cubic feet of pure air every minute per pupil, and the facilities for exhausting the foul or vitiated air therein shall be positive and independent of atmospheric changes."

The Pennsylvania law enacted in 1905 requires that school houses "shall provide for an approved system of indirect heating and ventilation by means of which each classroom shall be supplied with fresh air at the rate of not less than 30 cubic feet per minute for each pupil, and warmed to maintain an average temperature of 70° Fahr. during the coldest weather."

In 1914 the American Society of Heating and Ventilating Engineers promulgated a set of minimum ventilation requirements for public and semi-public buildings, which were recommended as model compulsory heating and ventilating laws. Those which applied to schools specified that:

"A positive supply of outdoor air shall, while school is in session, be provided the following rooms, and the quantity of this positive supply shall be equal to or in excess of the following minimum requirement per occupant per hour." The standard for class rooms, study and recitation rooms was given as 1,800 cubic feet, or 30 cubic feet per minute per person. Gravity indirect heating and ventilating systems are accepted for small schools not exceeding eight class rooms in localities where it is impossible to secure proper motive power, provided such gravity systems are capable of supply at least 30 cubic feet of air per minute for each pupil.

San Francisco has a section in the building law which requires "30 cubic feet of pure air per minute for each occupant," of all buildings designed to be used in whole or part, as public buildings, public or private institutions, school houses, church, public place of assemblage or place of public resort, including theaters and audience halls, factories, workshops and mercantile establishments.

The Sanitary Code of Chicago adopted in 1911 is very comprehensive and specific in the matter of ventilation. Temperatures exceeding 68 or 70 degrees are prohibetd in certain types of occupied buildings during the heating season. In street cars, elevated and railway trains a range from 50 to 75 degrees is permitted. There is nothing said about the fluctuation in air flow. There is provision requiring the removal so far as practicable of all noxious or poisonous fumes or gases or dusts arising in connection with a manufacturing process.

The Chicago Code specifies floor and cubic space requirements for different types of buildings as well as quantities of air to be passed through them. Air flow requirements vary from about 1,000 to 2,000 cubic feet per hour per person. A maximum CO_2 standard of from 10 to 12 parts per 10,000 is specified.

There is also included a section requiring that the relative humidity of certain enclosures shall not be less than 40 or 45 per cent and not more than 80 to 85 per cent. The lower limit of humidity would seem to be unjustified from existing experimental evidence.

The intent of the above laws and regulations is to provide good ventilation. A criticism that may be leveled against them is that they are too specific in the matter of air flow. There is not sufficient justification for demanding a continuous air flow in the proportion of 30 cubic feet per minute per person for so varied a group of buildings.

For instance, it is entirely feasible to maintain good ventilation in such places as school rooms when equipped with:

(a) Direct radiation.

(b) Window deflectors.

(c) Spacious gravity exhaust ducts on the inside wall.

(d) Readily adjustable windows.

(e) Readily adjustable temperature control, automatic or hand.

This type of ventilation shows from the experience of the New York State Commission on Ventilation great promise in providing cool atmospheres, with fluctuating air movement, free from offensive odors and large amounts of dust. And yet, under the above rules and regulations, this method is completely ruled out because of the positive air flow requirements of 30 cubic feet per minute, which can be produced only by mechanical means. Recirculation likewise is rendered impossible by many of these laws and regulations.

Notwithstanding the inconsistencies as pointed out above, there is a uniformity of opinion on certain fundamental ventilation requirements which we may group as follows:

1. Except in rooms occupied by a few persons only, ventilation solely by means of windows located on one wall of a building is unsatisfactory. Consequently, a school room with window exposure on one side only and without exhaust ducts cannot be ventilated in a satisfactory manner.

2. Assembly rooms, audience halls, theaters, court rooms and other places where people congregate in such large numbers that the floor space per person is not more than 10 square feet cannot be satisfactorily ventilated during the heating season except by means of mechanically propelled air.

3. During the summer time moving picture theaters and other places where people congregate to a similar extent demand mechanically propelled air for comfort. This may be accomplished by numerous circulating fans distributed at various points or by blower fans sending cool air through the enclosure, or by a combination of the two. The cooling of the air is done in various ways—by means of an air washer, ice or brine coils.

As to the ventilation of school rooms there exists a divided opinion. As already stated, the work of the New York Commission indicates certain undeveloped and hitherto unrecognized advantages of window ventilation with gravity exhaust. There is no question that the statutes regarding air flow for this type of room should be altered so as to permit the use of window ventilation.

Perhaps the most unsettled question at the present time is that of humidity. In rooms which are not overheated is humidification necessary for health and comfort? There is much to be said pro and con. The fact remains that we have much still to learn on this point. High humidity with high temperature is detrimental to health. Whether low humidity with temperatures below 70 degrees is objectionable is a matter still awaiting convincing evidence.

The study of sanitary insignificance of bacteria has been a new development since 1870. While within the period of 1880 to 1910 there was considerable perturbation over the danger of bacetria floating about in the air, as evidenced by our past efforts at gaseous fumigation, their significance from a ventilation standpoint is almost nil, a possible exception being in hospitals and operating rooms and certain industrial processes, such as the handling of hides and furs which may contain anthrax spores. There are other ways far more effective than ventilation for limiting the spread of infectious disease.

Deficiencies in Ventilation Laws

IN this article, the third and last of the series of three which embody the address of Dr. George T. Palmer, Epidemiologist for the Department of Health, speaking before the American Society of Heating and Ventilating Engineers, Dr. Palmer takes up the deficiencies in existing laws and enactments on ventilation.

A few of the existing laws regarding ventilation practices in the United States have been cited by Dr. Palmer, choosing these from several of the largest cities and making his choice cover practically the entire country.

Dust is a factor to be reckoned with in industrial establishments and in mines. It may be annoying in other buildings, but its significance below the limits of sensibility is slight. The suppression of dust in school, theater and mercantile establishments is largely a matter of floor cleanliness or location of air intake, rather than of air flushing.

Meeting the Present Day Ventilation Needs.

Aside from the special ventilation problems of industry involving dust and fume removal, the greatest need today in homes, offices, schools, barracks, prisons and hospitals is for facilities for maintaining a proper temperature range. This means easily adjustable windows, window deflectors, direct radiation, ready control of heating unit, either automatically or by hand, and where it is impossible to secure cross ventilation by windows, there should be provision for exhaust ducts with dampers near the interior of the room. It must be the aim of the engineer and the architect to provide people with the means to keep comfortably cool. We have had enough of the overheated radiator which cannot be turned off, the traversing of an occupied room by uninsulated steam pipes whose heat it is impracticable to cut off, the window which will not budge. More attention must be paid to these details in order to improve indoor air comfort in the less crowded inclosures.

In schools which are mechanically ventilated we discard the 30 cubic feet standard and also give up the idea that it is necessary to send air to every point in the room. The extremists in 1870 wished to flush a room as a body of policemen would clear a hall, pushing all before them. This was ventilation by displacement. We now ventilate by dilution. It would seem that still better results could be accomplished in schools and auditoria by substituting surface skimming in place of flushing. We must also substitute the intermittent or ejector type of air flow for the monotonous uniformity which now characterizes mechanical ventilation. This will mean changing the inlet register from its accustomed place on the inner wall to the space between the direct radiation and the outer wall. The course of air flow will be upward across the upper levels of the rooms and down the inner wall to the outlet. Windows may then be opened with impunity, the mechanical air flow creating an aspiring effect which will draw in the cold outside air and send it over the room. By this means we shall harmonize the conflicting interests of the teacher who wants the window open and the janitor who wants it kept closed.

The occupants of the room, it is true, will not be uniformly perflated. At times they will sit in an atmosphere higher in CO_2 than under the old arrangement, but they will not sit in direct draughts of

unvarying air currents, and consequently they can stand lower temperature. It is almost impossible, in many fan ventilated school rooms, to secure comfort at 68 degrees temperature, because of the appreciable air flow through the room, which cools by convection and evaporation. Seventy and even 72 degrees are more comfortable. Direct the circulating air over the upper portions of the room and temperatures of 68 and even 65 degrees are not uncomfortable. Dryness will not be noticed with overhead air circulation. Air from the windows will aid in giving a pulsating or fluctuating motion to the mechanically propelled air stream, which will be both pleasant and stimulating.

The adoption of this general plan for the ventilation of a theater has been recently described by Samuel R. Lewis. Its adaptation to auditoria and rooms similar to the ordinary school room holds out great promise.

Another weakness of present day ventilation is the great and unnecessary waste of fuel. There is no reason other than the 30 cubic feet of pure air standard, which militates against the use of recirculated air for many types of enclosures with ample space provisions, such as gymnasia, churches, large assembly halls sparsely occupied, stores and factories. The same air might just as well be recirculated with a consequent saving in fuel. The natural dilution that takes place will meet all hygienic requirements so long as the temperature is kept down below 70 degrees, and if this is done, humidification will in most cases be unnecessary. Odors are less pronounced in a dry atmosphere than in one of high relative humidity. In short, let us be free to apply the remedy that will insure maximum comfort, health and efficiency to each specific case, without being prevented from so doing by well-intentioned but overzealous requirements of air flow.

The deficiency of ventilation in warm weather is being overcome by the increasing use of the disc fan for evaporative cooling and the use of the air washer in theaters for lowering temperature by vaporization. This is a distinct advance of recent date in ventilation practice.

One further unsolved problem of the present day is the ventilation of railway coaches, parlor cars and sleepers during winter weather. This is almost wholly a matter of temperature control. There has been a signal failure in providing passengers with air comfort while traveling, and the journey without most uncomfortbale overheating day and night or else extreme underheating is a rare one. It is to be hoped that railroads will some day cater to their patrons to the extent of allowing them to be cool if they so wish. Screened, openable apertures in the side of the cars, accessible from the berths, would do wonders in placating the traveling public. As it is, a passenger must lie like a prisoner in a sweltering and suffocating berth, powerless to alleviate his discomfort.

Ventilation's Contribution to Better Health

DR. PALMER has spent a great deal of time in study and thought in an effort to help determine and provide the present-day ventilation needs and requirements.

In this article he has gone into some detail concerning the needs of the present-day school room and railway coach ventilation needs. He has put forth an effort to solve the fuel waste problem and to introduce economical and sanitary heating methods.

Dr. Palmer is definite in his opinion that the contributions of ventilation have been decidedly beneficial to better health.

The Contributions of Ventilation to Better Health.

Have advancements in ventilation contributed anything to human happiness, health and longevity in the last fifty years?

Most decidedly, yes!

The unnecessarily hot, damp factory which fatigued operatives prematurely and reduced resistance to colds and pneumonia, has largely disappeared in this time. Some form of ventilation is now looked upon as an integral portion of many types of buildings. It was purely an incidental factor fifty years ago.

The dust and fume exhaust system has, without question, contributed to our declining tuberculosis rate.

Today the open window by day, and more particularly by night, is known and utilized by many more than formerly. The lack of ventilation in living quarters is responsible today for much of the tuberculosis in the land of our good friend and ally, the French Republic. The American doughboy who sojourned overseas can tell you that good ventilation is an adjunct to health.

Air comfort prevails in theaters and assembly halls and in schools in an increasing measure each year, and pneumonia is losing its victims with each advance. Good ventilation as defined in the terms of 1921 is a big factor in the war on respiratory disease. As Dr. S. Josephine Baker has shown, cool rooms with fluctuating temperature and air flow specifically proved their value in reducing colds and respiratory affections among New York City school children in 1916 and 1917.

The mechanical blower and the steam radiator have been a Godsend to the factory operative and the girl at the department store counter. Even though located a long distance from the open window, these workers in our immense twentieth century buildings may be supplied with cool, revivifying air. There is no longer any excuse for adding high temperature fatigue to the normal fatigue of physical exertion.

To permit ventilation to aid still further in the cause of human welfare, there remains only the reframing of our laws, rules and regulations in the light of recent experience, so that ventilation essentials will be insisted upon and nonessentials be relegated to their proper subordinate position.

Just so soon as the hygienist incorporates in clear and understandable phraseology the health, comfort and efficiency demands of

ventilation, attributing to each element its proper weight and no more, and so soon as the weight of an enlightened public opinion transforms these requirements into legal enactments, we can depend upon those who build our enclosures—the engineer and the architect—to provide for us the condition desired.

F. R. Still: I think the author is not up to the most modern investigation as developed by the research work in our own laboratory. He is not aware that the fact is well established what a wet bulb should be. It should be according to the variations of air movement.

Dr. E. V. Hill: I think it is for us to continue to forge ahead and to work out some definite recommendations regarding recirculation of air, infiltration and things of that sort, instead of trying to answer statements regarding open windows. Let us go ahead and tell how to go a step further in using more economical equipment.

R. A. Small: In Wisconsin we are working along the lines of educating them to the use of mechanical ventilating equipment. They don't realize the necessity of ventilation, and in order to fool-proof the system we tie up the heating system in such a way that it can't heat without ventilating. We are not interested in whether it is a mechanical or gravity system, or window system, or so forth; we simply say in the code that you must have such and such results. Anything that you can produce that will convince us that you get those results is all right, let's have it. But it is up to you to furnish a system that will ventilate as well as heat.

E. S. Hallett: Down in St. Louis we have more ventilation than any place in the world, and we don't build anything but all blast systems. We have no law of any kind whatever to hamper us. We can demonstrate that you can ventilate and heat at the same time, giving 30 cubic feet of air to every person in the building and do it for less than to put radiators under the windows and have no ventilation.

F. R. Still: We had a school in Minneapolis where we sent the air right into the faces of the pupils and they thrived on 10 cubic feet. Take any of this elaborate equipment, put it up as it is and you can't operate the school without operating fans. You can operate that Minneapolis school on half of what you can with any open window ventilation that does not come within 50 per cent of the results. If the public prefers the open window, let's determine that definitely. If we are fooling our time and the Society's on all this investigation, the sooner we know it the better. It is an economic waste if we do not determine it logically.

W. H. Carrier: We have had a basis of 30 cubic feet which was established on the known fact that ventilation was an essential from practical experience. Just what amount was required was not known. I think that it is very probable that you can have 10 cubic feet or 20 cubic feet if you put it in the right way, but it is a question of distribution and not of amount. If you put in 30 cubic feet and in such a manner that it just goes in and out, it doesn't mean anything and yet you are complying with the law.

J. W. H. Myrick: I have found it good practice to make my fresh air inlet on the ceiling, a duct about 4 to 6 inches in depth and 14 to 16 inches in width with the proper number of small inch openings on the side to supply any air-change needed. This form of supply will act like a sprinkler system, allowing a well distributed amount of fresh air to fall like a plate into water and before it has worked its way down through the strata of overheated air at the ceiling, it has been tempered to a degree not objectionable, nor not over-heated and pasteurized and its freshness destroyed.

Walter Keiser: Experiments indicate so far that mice, which have been poisoned more or less by their exhalation, are revived and brought back to their usual activity by ozone in concentrations estimated at from 1 to 10 parts per million, and that if left in the air contaminated by their own exhalation they die. The action of the ozone seems to be the elimination of the poison of the exhalations by oxidation and when drawn into the lungs it tends to be selectively absorbed by the blood.

To those having experience in using ozone apparatus to destroy odors, it is a well known fact that often it is not possible to free a room of odors until the machine has operated in the room for some time, often as long as two weeks. It would appear that the experimenters in this case stopped too early, and had they rid the room of the excess of material causing bad combination of odor first, their work would have been attended with greater success.

Second Edition of Guide of American Society of Heating and Ventilating Engineers Is Out.

The second edition of the American Society of Heating and Ventilating Engineers' Guide has just been published. It is a well-printed book of 400 pages and contains a great deal of information for men engaged in heating and ventilating, both as to appliances that are considered reliable and as to some of the latest tests that have been made of various types of apparatus in these fields.

The last forty pages show the complete roster of the membership, showing year of affiliation, business connection and address.

Among those whose apparatus is described are Honeywell Heating Specialties Company, International Heater Company, Haynes-Langenberg Manufacturing Company, Thatcher Furnace Company, Utica Heater Company.

Copies of this valuable data book may be obtained for $3.00 through AMERICAN ARTISAN Book Department, 620 South Michigan Avenue, Chicago.

Don't let talk about your goods become mechanical like that of the book agent. Talk naturally and vary your language to keep it free from sing-song character.

Majestic Company Dealers Hold Conference at Huntington, Indiana.

For a number of years it has been the policy of the Majestic Company, Huntington, Indiana, to hold summer meetings for their various furnace dealers. These meetings are devoted to short talks and discussions on the latest and most practical methods of selling and installing the Majestic Warm Air Furnace. The conferences as they are more correctly called, have proved their worth not only to the dealer, but to the manufacturer as well. Here the dealers and manufacturer come together face to face and talk pure unadulterated facts straight from the shoulder.

The accompanying illustration shows a group of dealers assembled at the plant of the Majestic Company for the annual conference.

Of course, you know that these men did not come only to talk business. There was the social get-together as well. The time of the social gathering was in the evening; the place, the local Country Club. Speakers were arranged for and various other forms of amusement were also thought of.

Judging from the expressions on the faces of those present, the men were either worked up to a high pitch of enthusiasm for the banquet or some one told them some real interesting news about their work or themselves, or perhaps both.

These men are unanimous in their opinions that the annual meetings are very helpful to all parties concerned. Not only does the dealer acquaint himself with the manufacturing of the product that he sells and its marketing, but personally meets and becomes acquainted with the entire personnel of the organization which is most important.

Business of today is not all dollars and cents. There is more sentiment in the business of today than yesterday and will be more in tomorrow.

The Majestic Company is thoroughly sold on the idea of having summer meetings for its dealers.

Here's Proof that the Majestic Company Dealers Believe in Conferences with the Manufacturer. Photo Taken at Majestic Company Plant, Huntington, Indiana.

Success Heater & Manufacturing Company Files Bankruptcy Plea.

According to the Des Moines, Iowa, *Register* of Friday, August 17th, John P. Wagner, President of the Success Heater and Manufacturing Company of Des Moines, has filed a petition with the clerk of the Federal court, asking that his corporation be declared bankrupt, and that W. D. Beard of Des Moines be appointed receiver for the firm. The offices of the company are located at 1015 Murphy Street.

The petition will be heard by the referee in bankruptcy on August 27th.

It is understood that the receivership proceedings are of a friendly nature, and that the petition will in no way interfere with the operation of the factory or sales campaign which is now being carried on by President Wagner, who remains in charge of all activities as before.

A meeting of the creditors has been called by Referee Frank J. Comfort, to be held in the Federal Building, Des Moines, on September 20th, at which time it is expected that a trustee will be appointed.

Globe Furnace Catalog Contains Valuable Information.

Instructive and interesting is the furnace pamphlet issued by the Globe Stove & Range Company, Kokomo, Indiana. The booklet deals exclusively with the Globe Cast Furnace and takes up in a logical sequence a full explanation of the furnace in question, giving ample illustration, in order to bring out clearly just what relation each part bears to the whole.

Under the heading "Specification" the sizes of the various parts of the furnace are given.

The Globe Pipeless Furnace, the Globe School Room Heating System and the Globe Room Heater,

with ample illustrations, are fully explained.

Suggestions for installing the furnaces are given some prominence in the booklet.

For additional information write the Globe Stove & Range Company, Kokomo, Indiana.

Premier Warm Air Heater Co., Issues High Class Catalog.

We are in receipt of a copy of the new catalog of Premier warm air heating systems.

Very handsomely printed, with excellent illustrations and really informative descriptions, this catalog should prove just what "Buck" Taylor, Premier Manager of Sales, says in his letter to us, "designed to sell the dealer's prospects rather than selling the dealer."

"Buck" states further: "This is the first copy to leave our office, as we have received only a limited supply, but we expect to have the full shipment within a few days for distribution to the trade."

Furnace installers may obtain a copy by writing to the Premier Warm Air Heater Company, Dowagiac, Michigan.

Arguments with Snap Pull Business for Local Furnace Distributor.

"Heat your home with a scientifically correct warm air furnace." Here is an excellent appeal to intelligent reasoning. Note the use of the various sizes of type for the headline, the explanation, the name of the furnace and the name of the distributor. The illustration of this advertisement is very well placed to attract the attention of persons needing furnace work or expecting to install a furnace.

The advertisement carries just enough reading matter to attract attention and to answer any questions that enter the prospect's mind while reading the ad.

First the ad calls attention to its scientifically correct construction, telling where these furnaces can be seen, and then strengthening the first statement by the words: Economical, efficient and lasting.

Where one of these words is used the other two must inevitably follow. For instance, if the economical is used alone it may leave the impression that the economy may

have been gained at the cost of efficiency or vise versa. The word "lasting" is also well used, as it clinches the whole argument and brings out the fact that the furnace is not only economical and efficient, but lasting as well.

The fact that these furnaces are being installed in Grove Park residences may be enough to convince a large number of prospects that the furnace deserves inspection, as Grove Park may be a very desirable section of the city in which to live and consequently people of good judgment would be living there.

Warm Air Register Makers Will Meet in New York City, Tuesday, September Fourth.

The manufacturers of warm air registers will hold a special meeting in the forenoon of Tuesday, September fourth, preceding the meeting of the Joint Committee on Standardization of Warm Air Registers.

Both meetings will be held at Waldorf-Astoria Hotel, New York City, and a full attendance is looked for at both sessions.

Richardson & Boynton, Chicago, Move to New Building.

The Richardson & Boynton Company have announced their removal to their new warehouse and office building at 3639 to 3645 South Ashland Avenue, Chicago. The new telephone number of the firm is Lafayette 0560.

Safeguard Your Premises Against Fire.

Remember that the great majority of fires could be avoided by a little timely foresight and care. Precaution in looking after your premises may be the means of saving lives as well as valuable property. See that your chimneys and stovepipes are in good condition and keep the cracks in your chimneys cemented up. Guard against the accumulation of old dry leaves and rubbish in fence corners and buildings. "An ounce of prevention is worth a pound of cure" in averting fire loss. Safeguard your premises against fire and you will be surprised at the effect it will have on your property. Remember it is the people and the policyholders who pay the loss.

Sheet Metal Contractor Outwits Carpenter in Bidding for Metal Trim Erection Details at Missouri Pacific Hospital, St. Louis.

Carpenters Fail to Convince General Contractor of the Necessity of Using Wood in Preference to Sheet Metal.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by O. W. Kothe, Principal, St. Louis Technical Institute, St. Louis, Missouri.

"YOU can't!"

"We can."

"We'd like to see you do it!"

"Well, you'll see us, and do a mighty good job too."

"You mean to tell us that you sheet metal workers are going to put up those hollow metal door and window frames without using a stick of wood to support them?" says the carpenter.

"That's just what we mean to do," says the sheet metal worker—"you see it is our profession to work in metal, and these frames are metal, and that is why they belong to us."

"Well, we are going to have that hollow metal trim work," says the carpenter.

"We'll see about that," says the sheet metal worker.

And that is how the quarrel began some 20 years ago; and it is just now budding into its climax. At the Missouri Pacific Hospital, St. Louis, and other cities throughout the country, under erection this entire drama was re-enacted, only in its intense form, and the above is somewhat the conversation between our sheet metal workers and the carpenters. Because the federal board of awarding has given this metal trim to the sheet metal worker, where it rightfully belongs, the carpenter has to change his tactics, since formerly he could eventually hope to crowd us out. But now when an official seal has been set, the carpenter is jumping the traces, and figuring up all sorts of schemes under which he may lay claim to this work.

At the Missouri Pacific Hospital, the carpenter felt that if he could convince the general contractor that wood must be used in their erection—the frames could not be made rigid without wood, and that since wood is an important part in their erection, that would subvert the metal trim to the wood, and he could lay claim to it on the basis that wood is first cause, and metal is second cause.

Carpenter's Efforts Effectively Blocked on St. Louis Job.

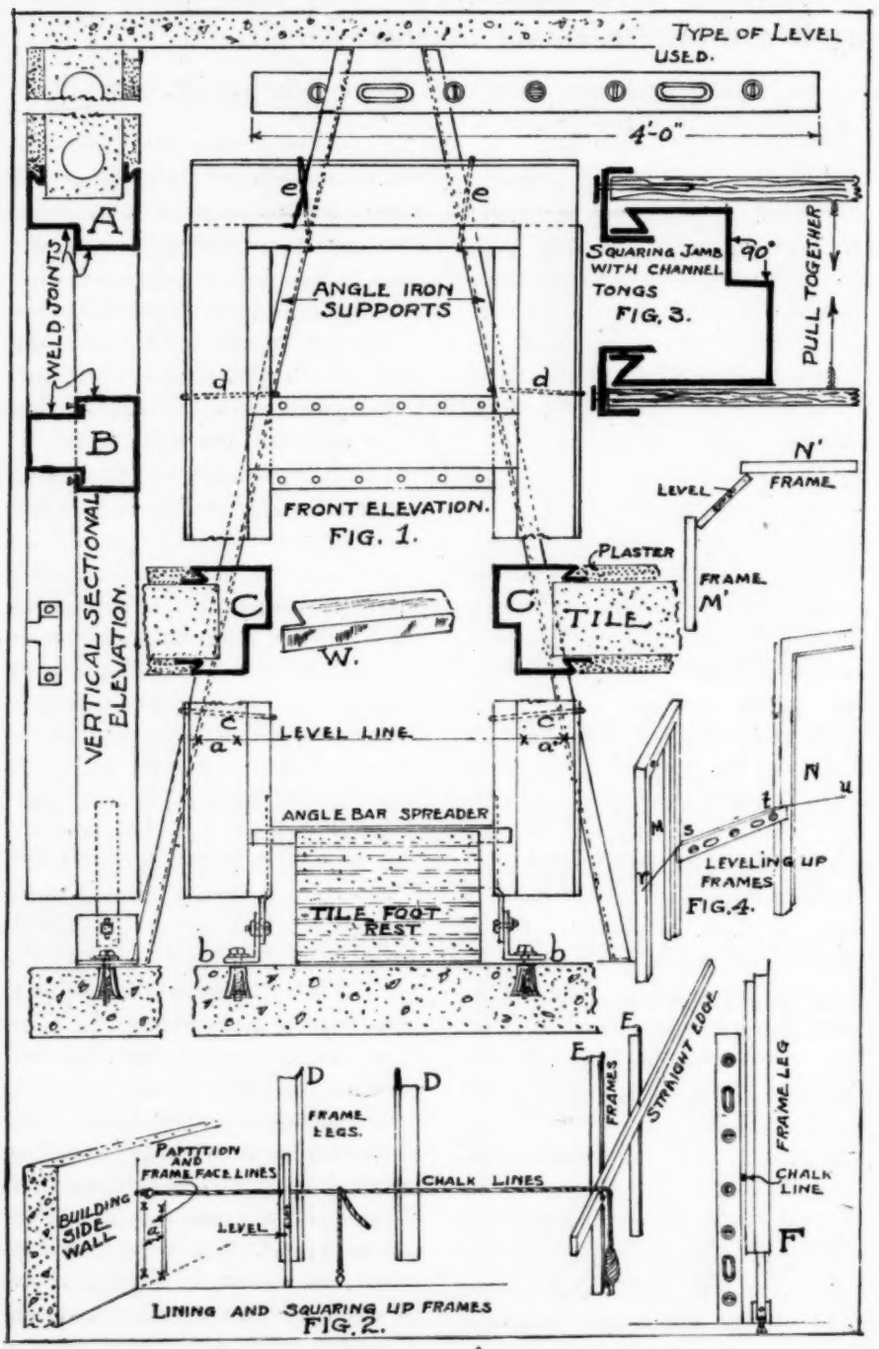
But happily Business Agent Henry Katzel and his able staff of mechanics on the job did not reason thus, but maintained that the metal frames were first cause, and that they did not need any wood at all. Therefore, wood was ruled out entirely, and the carpenter had nothing to stand on. There were eight sheet metal mechanics on the job, and distinct credit is due Business Agent Katzel for their selection. There is A. J. Marentette, Harry Rhodes, Joe Duspiua, Charley Little, Fred Schumann, Clifford Ehehardt, S. Sayers and Freddie Gear. Just which one of these fellows suggested to use angle iron supports to take the place of wood is not clear to the writer, but I suppose the carpenters feel it was a regular "Yankee trick"; but it did the work and blocked the carpenter's efforts.

Now in our drawing we have some of the details and working methods as are met with in erecting these frames at this hospital. First, we must bear in mind that these metal frames must be set before any of the partitions are set. The entire enclosure of each floor space is like an open space or auditorium. Here A. J. Marentette does the laying off of partitions on the walls and the supporting columns, draws his lines with a chalk line, and marks the opening of door from measurements directed from the plans. Now this is quite an important thing, as there is the thickness of the hollow tile brick work; the thickness of plaster to account for. The frames must be set so that these lines will correspond.

In Figure 1, we have the general details of a side sectional and front elevation. While at Figure 2, we show how the partition walls are marked off, and a line is run on the floor. Then the door frame is marked off the angle clips b-b of Figure 1 are set in position for receiving the lower legs welded to the frames. Star concrete drills are used for drilling holes as at b-b sufficiently deep to allow the expansion bolt of ¼ inch by 2½ inch to enter. The frame is then shimmed up to its given height, using bricks, tile, or other blocks for setting under the legs. On each frame a level line is drawn as a-a- in Figure 1. This line is drawn from three to four feet up from the bottom, but whatever dimension is used, that dimension must be used on all frames, so a uniform height will be maintained for all frames and doors. When these are set, long angle iron supports, as shown in Figure 1, are wedged between the floor and ceiling right back of the frame, so that the frame can be wired to these supports as at c-c; d-d; e-e.

When this is done the legs are bolted to the angle clips at b, and the entire frame is gone over again to line it up perfectly square, plumb, and level. For this a level as at the top of our drawing is used, being four feet long. This is placed along

the level line a-a- and the frame is adjusted to suit. Next we must see that both legs are on a line with the partition line as in Figure 2, where D-D are frame legs, and E-E are frame legs on another side partition. In the absence of a second partition, as E-E, the chalk line is run on the floor, and a level is placed vertical as at F, to note if the frame does not tilt backward or forward. Any irregularity must be straightened and the supports anchored accordingly. An angle iron spread bar is placed near the bottom so the legs will not be drawn in or spread apart, and thus make it inconvenient to set the wooden doors, which are to be used. A tile is often used to rest this spreader bar on, as shown in Figure 1.



Working Drawing Proves That Metal Trim Work Is a Success and That Frames Can Be Made Rigid Without Wood.

From our detail of frame bars, we see the shape of the members are extremely simple, about the most simple structure that could be made. Where transom bars are met with in hall doors, they are welded in as shown, much the same as the top lintel bar is to the side jambs. These frames are then tied in bundles of four or six, well wired and shipped that way. So the mechanic has really no cutting and fitting to do on them. The only thing, as Mr. Marentette explained, the jamb members are not always square, and that nearly every frame must be trued up. About this time a fellow workman, Mr. Dispiua, I believe, came along with two innocent looking pieces of boards with small steel channels nailed on the ends. These he clamped in position as in Figure 3 and pushed together, and said: "That is how we straighten these frames so the jamb member is square. It does the work and does not put a concave depression in the flat sides as most any other kind of spreading would do. You see, if we would not square these members; then when the carpenters would get to hang the doors—they would never get through hollering about the 'bum' job we did, and it makes it impossible for them to fit their doors the way they should." The channels are about ten or twelve inches long, and they are nailed to a board about 5 by ¾ inches and thirty inches long.

Then in leveling frames, which is very important task, the frames must all be of the same height, as well as vertical in every direction. Take in Figure 4, where at M′ and N′ are two frames set in partitions at right angles to each other, so a level line is maintained as shown by r-s-t-u. It would seem that after the anchor bolts in the angle clips are set that little leeway could be gathered for shifting the frame one way or the other a bit. But to the mechanical turn of mind, many novel stunts can be pressed into service. In these iron legs the hole is made oblong, but owing to the waviness in the concrete it is not enough, so the angle clips must be sawed from the top, working a slot in the clip, which lets the legs rise or lower as required. Then if one leg of jamb protrudes over the line a bit, the expansion bolt b is loosened, is tilted over, and some iron wedges are laid under the raised end

of clip and is bolted down again and in this way as much as half an inch can be gained, which saves drilling new holes in the floor. That space between the bottom of the jamb and the floor is later filled in with beveled floor strips concreted down, so the wood will fit around the metal, or if a composition floor is put in, the base board which is also of composition is made to lap around the metal. Right here, we must say, that it is amazing that the carpenters do not claim the running of these floors or base boards, stairs, etc., all of which substitutes much of their former work. If they do not claim that, they have no logical hold on metal trim, even though it does take away a lot of their former high class work.

This in general is the way the work on the Missouri Pacific Hospital was put up and our men did a mighty fine job too. The bricklayers follow up, inserting their hollow tile in the trim as shown and fill in the partitions. They do not need to mark out their lines, as we do that for them, when we lay the lines for setting the frames. When the brick work is set, the angle iron bare are removed and used elsewhere. The plasterers then fill in the remaining space so a flush appearance is produced, as shown by details A-C-C.

Due credit must be given Business Agent Katzel for the fight he has waged to secure this work, and the wisdom he displayed in selecting some ably experienced war horses to run the job, and it makes a fellow's heart feel good to see the way they go at it. The carpenters took their few men off the job, but the council decided against them, and so our men went ahead with the work. Everywhere the sheet metal trade must become aggressive for this trim work. Sheet metal employers must be interested in it, as it is most of them are tinshop patrons equal to those of 40 years ago. It is true, they hang out a shingle, Cornice, Skylight, Blow Piping, Heating, Ventilating, etc. But most of these words do not mean anything, as soon as any important job crops up they refuse to figure it, until some outsider comes in and gets away with a handsome profit, then they talk. Our men are that way, too, considering the great masses—they love to display big signs, but they only work the corners, and leave the center to some other fellow who has courage, vision, resourcefulness.

Inlet on Schumacher Dust Collector Must Be Connected on Tangent—Harrison.

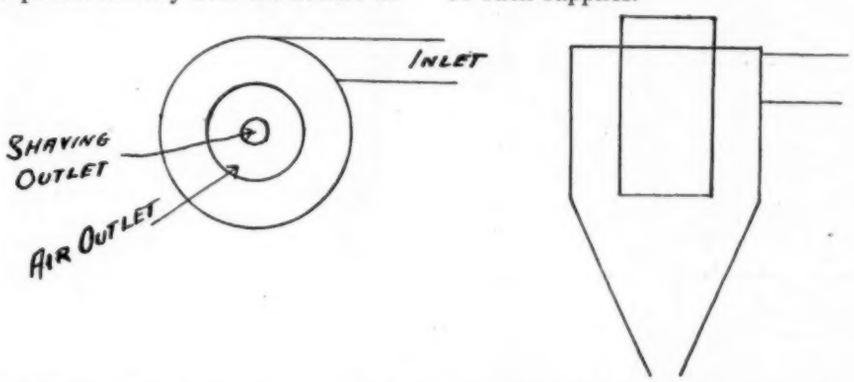
R. F. Schumacher submitted a problem, appearing on page 27 of our August 4th issue, regarding the correct position of a dust collector. Mr. Schumacher was in doubt as to the correct measurements and whether or not the collector should be placed directly over the boilers or to one side, in order to obtain the best results. A sketch of Mr. Schumacher's arrangement also appeared.

E. S. Harrison has sent in a comment on this problem which runs as follows:

To AMERICAN ARTISAN:

In regard to Mr. Schumacher's problem on page 27 of August 4th issue, I would say that I have never seen such things connected to boilers, but have made "cyclones" for separating air from shavings. The inlet is connected on a tangent, which causes the shavings to whirl around the outside until they drop out at the bottom, the air passing out at the top. The shavings will blow out the top if the inlet is not connected on a tangent or if the apparatus becomes filled to the air outlet. E. S. HARRISON.

———, Michigan.



E. S. Harrison Believes the Inlet of the Dust Collector Should Be Connected on a Tangent.

Rufus R. Zander Opens Sheet Metal Shop in Madison.

Rufus R. Zander, for the past five years foreman for the Fuller & Johnson Manufacturing Company, Madison, Wisconsin, has opened a furnace and sheet metal business of his own at 2337 East Johnson Street in that city. Mr. Zander has spent the last twenty-five years at the sheet metal business, during which time he has been employed in small tin shops, large corrugating works and in the wholesale hardware business.

He expects to do a general sheet metal business as well as to install warm air furnaces, and will be glad to receive catalogues and price lists from manufacturers and distributors of such supplies.

Ewert Sells Interest in Kutscheid Manufacturing Company—Resigns Offices.

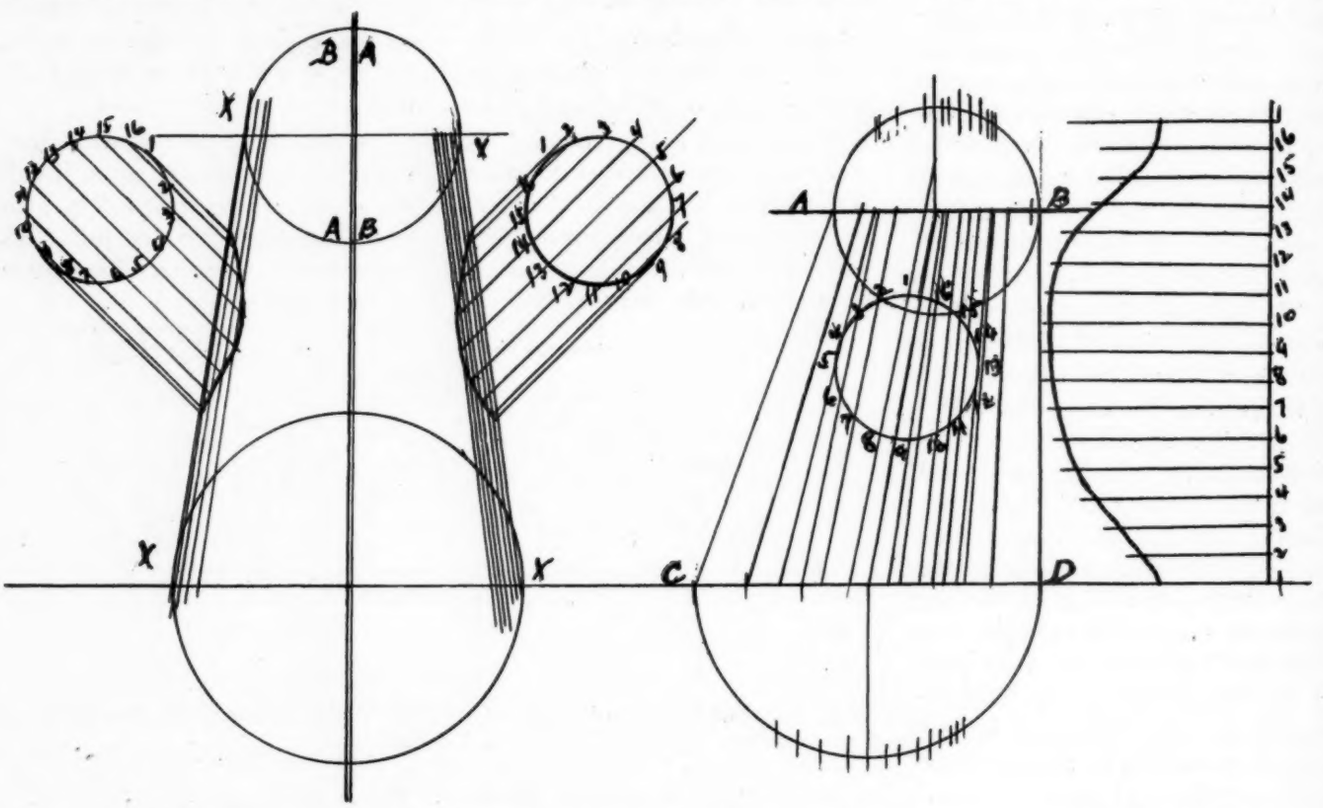
Fred C. Ewert, of Ewert & Kutscheid Manufacturing Company, Chicago, makers of the Peerless Steel Squaring Shears, has resigned from the office of Secretary and Treasurer and also from the board of directors. Mr. Ewert's entire interests were purchased by John J. and Joseph J. Kutscheid. All business matters will be transacted through John J. Kutscheid, who has charge of the office and sales end of the business.

Economizing on light in the show window is as sensible as hiring a first-class salesman and putting him at work handling stock and scrubbing up in the back room.

Harrison Believes He Has Solution to Koeberle Cylinder Pattern Problem.

In our issue of August 4th, page 27, Koeberle-Heyer Company submitted a difficult problem in pattern cutting, asking that we publish same for solution.

E. S. Harrison has taken it upon himself to submit a solution which he believes will answer. Mr. Harrison's letter with diagram are as follows:



The Above Sketches Indicate How E. S. Harrison Arrived at the Solution Which He Submitted and Which He Believes Will Solve Mr. Koeberle's Pattern Problem.

To AMERICAN ARTISAN:

The problem submitted by Mr. Koeberle in the issue of August 4th interested me greatly. The more I tried it, the more interested I became. I am submitting a solution on the chance that no one else has tried it.

The difficulty, as I found it, was to find the points of intersection of the cylinder with the cone. To do this I used the second view on my plan. To draw straight lines up the sides of the cone through the points 1 to 16 I divided the ends of the cone into equal parts, connecting three of these points with heavy lines for guide lines. On the left side I was able to make each line pass through two points. The ends of these lines were projected to the circles above and below, and from there transferred with the dividers to the first view at the points marked "X". Lines connecting these points gave the points of intersection from which the rough stretchout at the right was made. The first view is shown in two halves to avoid confusing the lines on a small drawing, each half giving one-half the pattern. It will be noticed that this cylinder will be right or left hand, according to the way it is rolled.

E. S. HARRISON.

———, Michigan.

Has Read Every Issue of AMERICAN ARTISAN Since 1884.

To AMERICAN ARTISAN:

Enclosed please find my check for $2.00 for next year's subscription. I have read every issue since 1884.

C. W. DAVIS.

Whitewater, Wisconsin, August 20, 1923.

Ohio Auxiliary Membership Drive Initiated By Secretary R. L. Shugg.

R. L. Shugg, of the American Rolling Mill Company, Cincinnati, Ohio, and Secretary of the Ohio Jobbers' and Salesmen's Auxiliary, has promulgated the initial effort toward increasing the membership of the Auxiliary.

In a letter to AMERICAN ARTISAN, Mr. Shugg gives an excellent outline of the work which will go forward in a short time.

The letter follows:

My dear Mr. Pedersen:

You will probably remember that I told you in Cincinnati recently that I should call on you from time to time for help in my efforts to increase the membership of the Jobbers' and Salesmen's Auxiliary to the Ohio Sheet Metal Contractors' Association, so here's the first request for some help.

Within the next two or three weeks we hope to send out a letter to manufacturers and jobbers outlining the aims of the Auxiliary and requesting them to take out mem-

berships for all of their salesmen who call on customers located in the state of Ohio.

Special mention, of course, will be made of the classified roster which we are going to get out, and this we hope will prove one of our strongest arguments. Undoubtedly, it will be our best argument if we can get the sheet metal contractors to display these cards in their shops and consult them when they are in the market for materials. Therefore, anything you can write up in your magazine to sort of prepare the way for both the letter and the roster, should help us considerably.

We want the manufacturers and jobbers to see that it will really be cheaper for them in the long run to have their salesmen belong to the Auxiliary, and, likewise, we hope to be able to instill a kindly feeling in the minds of the sheet metal workers towards the importance of the Auxiliary, when they are planning to make purchases.

You expressed your ideas so nicely before the directors' meeting at the recent Ohio Convention in Cincinnati, that I know you will have no difficulty in writing a splendid article with no outside assistance. However, if you need any special information, I shall be only too glad to use my best efforts in your behalf.

Sincerely yours,

R. L. SHUGG.

The roster, corrected to August 1, 1923, is classified in such a way that all members, for instance, who are engaged in making or selling warm air furnaces will be classified in the roster under the division of Warm Air Furnaces. This classification of members will be carried out in like manner in all lines. The name and address of the member, as well as that of the company he represents, will be given.

The roster containing 103 names, corrected to August 1, is as follows:

NAMES OF AUXILIARY LIST.

Ohio.

A

Ahlbrandt, G. F., Middletown, Ohio, American Rolling Mill Company.

Auer, George G., 3608 Payne Avenue, Cleveland, Ohio, Auer Register Company.

B

Baechel, Emil E., 519 Walnut Avenue, N. E., Canton, Ohio, The Berger Manufacturing Company.

Baldwin, F. G., Cincinnati, Baldwin Tarvin Company.

Barry, F. W., Hamilton, Estate Stove Company.

Beinert, W. G., 2949 Glenview Avenue, Cincinnati, Ohio, The Deim & Wing Paper Company.

Buchanan, D. S., Jr., 411 First Natl. Bank Bldg., Cincinnati, Ohio, C. G. Hussey & Company.

Buhr, J. A., Cincinnati, Ohio, F. H. Lawson Company.

C

Cain, A. S., 805 S. Eighth, Richmond, Indiana, The Standard Metal Company.

Carfer, F. O., Cleveland, Ohio, J. M. and L. A. Osborn Company.

Cohn, Etta, 620 S. Michigan Avenue, Chicago, Illinois, American Artisan and Hardware Record.

Coughlin, Joe.

Crail, E. J., Lima, Ohio, The Tiffin Art Metal Company.

Culver, C. O.

Curtis, E. H., Box 67, Syracuse, New York, W. H. Colebrook Sons.

D

Dayhuff, E. V., R. F. D. No. 7, Canton, Ohio, The Canton Art Metal Company.

Dean, R. C., Cleveland, Fuel Saving Heater Corporation.

De Ved, Charles, New York City, E. A. Scott Publishing Company.

Dieckmann, A., Cincinnati, Ferdinand Dieckmann Company.

Dietz, W. E., Cincinnati, Williamson Heater Company.

Du Gray, William A., Youngstown, Sheet Metal Manufacturing Company.

Duffer, C. F., Cincinnati, F. H. Lawson Company.

E

Edwards, J. R., Columbus, Ohio, The Vendor Slate Company.

Eisenman, James A., 828 S. Washington Street, Monroe, Michigan, The Monroe Foundry and Furnace Company.

Erk, E. H., Columbus, Ohio, F. O. Schoedinger Company.

F

Fast, H. H., Ashland, Ohio, The Rybolt Heating Company.

Foster, Fred F., 108 W. Fifth Avenue, Columbus, Ohio, The W. E. Lamneck Company.

Friedley-Voshardt Company, 755 South Halsted Street, Chicago, Illinois.

Fromm, Adolph, Chillicothe, Ohio, The Wheeling Metal Mfg. Company.

Fulton, W. S., 2365 North Fourth Street, Columbus, Ohio, The Berger Mfg. Company.

Farrell, T. E., Youngstown, Ohio, The Sheet Metal Manufacturing Company.

Fitzgerald, T. J., Youngstown, Ohio, The Sheet Metal Manufacturing Company.

Faulkener, C. J., Dayton, Ohio. Ohio Metal Manufacturing Company.

G

Gardner, Milo M., 1359 Elwood Road, East Cleveland, Ohio, The J. M. & L. A. Osborn Company.

Garling, E. O., 14006 Shaw Avenue, Cleveland, Ohio, The Ferbert-Schorndorfer Company.

Gillespie, Lee W., Cincinnati, Ohio, The F. H. Lawson Company.

H

Haupt, F. C., 5127 North Lincoln Street, Chicago, Illinois, The Sall Mountain Company.

Henninger, J. G., Cleveland, Ohio, The J. M. & L. A. Osborn Company.

Hoffeld, E. H., 1181 Harrison Avenue, Cincinnati, Ohio, The Ferdinand Dieckmann Company.

Hossler, D. A., Cleveland, Ohio, J. M. & L. A. Osborn Company.

Howe, A. W., Cleveland, Ohio, The J. M. & L. A. Osborn Company.

Heonek, R. L., 9 Ridgeway Avenue, Ft. Thomas, Kentucky, The Huenefeld Company.

Huffman, W. F., Galion, Ohio, The Canton Art Metal Company.

Hayden, P. W., Wheeling, West Virginia, Wheeling Corrugating Company.

J

Jones, H. R., 308 Kenmore Road, Indianapolis, Indiana, Tanner & Company, Indianapolis.

K

Kreckler, H. B., 158 Oak Street, Ludlow, Kentucky, The Fox Furnace Company.

Kimble, W. W., Cleveland, Ohio, J. M. and L. A. Osborn Company.

L

Lamneck, W. E., Columbus, Ohio, The W. E. Lamneck Company.

Lamneck, George V., Columbus, Ohio, The W. E. Lamneck Company.

Langenberg, E. B., St. Louis, Missouri, Haynes-Langenberg Mfg. Company.

Lennon, John T., 6764 A Page Avenue, St. Louis, Missouri, The Lennox Furnace Company.

M

McGough, C. T., Box 244, Bridgeport, Ohio, Wheeling Corrugating Company.

McHale, R. L., Philadelphia, Pennsylvania, David Lupton Sons Company.

Millard, F. C., 512 West Market, Lima, Ohio, The Fox Furnace Company.

Minshall, H. C., 163 Chittenden Avenue, Columbus, Ohio, Steelcote Manufacturing Company.

Mirick, F. G., Columbus, Ohio, F. O. Schoedinger Company.

Moeschl, Frank A., Ninth and Lowell Street, Newport, Kentucky, Newport Rolling Mill Company.

Munkel, A. E., Columbus, Ohio, Munkel-Lamneck Company.

Mull, E. F., Zanesville, Ohio, The Tourain Paint Company.

Myers, E. A., 862 Prouty Avenue, Toledo, Ohio, The Perfection Furnace Pipe Company.

Mabley, R. R., Columbus, Ohio, Columbus Slate Company.

Martin, W. G., Youngstown, Ohio, The Sheet Metal Manufacturing Company.

Montgomery, Joe, Canton, Berger Manufacturing Company.

Mudgett, A. P., Wabash, Indiana, Honeywell Heating Specialties Mfg. Company.

N

Nebel, A. L., 482 East 117th Street, Cleveland, Ohio, Nebel Mfg. Company.

Newey, George W., 649 Laurel Avenue, Zanesville, Ohio, International Heater Company.

Niehaus, C. J., Cincinnati, Niehaus Stove & Furnace Repair Company.

Nast, Henry, Cincinnati, Huenefeld Company.

O

Olden, Harry L., 230 East Front Street, Cincinnati, Ohio, Cincinnati Sheet Metal & Roofing Company.

P

Patton, B. F., 1216 Dueber Avenue, Canton, Ohio, The Totten-Patton Company.

Pedersen, A. G., 620 South Michigan Avenue, Chicago, Illinois, American Artisan & Hardware Record.

Price, T. A., Genoa, Ohio, The Tiffin Art Metal Company.

Preyer, A. P., Cincinnati, American Rolling Mill Company.

R

Rayden, B. A., 11511 Timblett Street, Cleveland, Ohio, The National Paint and Varnish Company.

Root, E. B., 424 Woodland Avenue, Birmingham, Michigan, The Detroit Safety Furnace Pipe Company.

Rector, C. L., Canton, Eller Manufacturing Company.

Ross, R. R.

S

Schwarz, S. A., 6608 Pennsylvania Avenue, Cleveland, Ohio, S. C. Schwarz Paint & Varnish Company.

Scott Edwin A., 15 East Fortieth Street, New York. E. A. Scott Publishing Company.

Sherry, J. H., 1219 Cranford Avenue, Lakewood, Ohio, The F. O. Schoedinger Company.

Shugg, R. L., 1402 Union Trust Building, Cincinnati, Ohio, The American Rolling Mill Company.

Skinner, E. H., Cleveland, Ohio, The Fox Furnace Company.

Smith, Harold J., 14603 Show Avenue, Cleveland, Ohio, The J. M. & L. A. Osborn Company.

Snow, H. S., Box 308, Canton, O., The L. J. Mueller Furnace Company.

Stermer Joseph A., 1606 Daumer Avenue, Cincinnati, Ohio, The Williamson Heater Company.

Schoenhard, G. L., Youngstown, Ohio, The Sheet Metal Manufacturing Company.

Scott, G. W., Youngstown, Ohio, The Sheet Metal Manufacturing Company.

Senour, A. A., Cleveland, National Paint & Varnish Company.

Strickland, D. M., Middletown, Ohio, American Rolling Mill Company.

T

Taylor, R. E., 1225 West 9th Street, Cleveland, Ohio, Fox Furnace Company.

Ticknor, L. B., 33 Warren, Columbus, Ohio, J. M. and L. A. Osborn Company.

Taylor, N. & G. Company, Philadelphia, Pennsylvania.

W

Waller, C. E., Nellie, Ohio, Wheeling Corrugating Company.

Walsh, J. V., Pittsburgh, Pennsylvania, Follansbee Brothers Company.

Watson, A. E., Care San Marco, Apt. 7, Cincinnati, Ohio, Berger Manufacturing Company.

Wente, E. H., Cincinnati, The F. H. Lawson Company.

Wiest, F. W., Cincinnati, Huenefeld Company.

Wilson, H. O., Canton, Berger Brothers.

Wetmore, W. S.

Wilberding, Frank H., 12958 Clifton Boulevard, Cleveland, Ohio, The Ferbert-Schorndorfer Company.

Wise, W. G., Akron, Ohio, Wise Furnace Company.

Z

Ziegler, Walter H., 207 North Hoepley, Muncie, Indiana, F. O. Schoedinger.

Time Saving Tables for Estimating Sheet Metal Duct Work Compiled By Ernest V. Lippe, Chicago.

Experience in estimating costs of various mechanical systems in the installation of buildings such as heating, plumbing, ventilating and wiring has taught Ernest V. Lippe, Mechanical Engineer, associated with the Haines Company, 1933 West Lake Street, Chicago, that the time consumed in figuring weights of duct work of ventilating systems far exceeds the time required to estimate quantities of the other mechanical types of installations above mentioned.

Any method that will help to reduce the time consumed to estimate the weights of ducts of ventilating systems in buildings is, therefore, a welcome feature to sheet metal ventilating contractors or their estimators.

Mr. Lippe, therefore, takes this opportunity to present to you an example of a set of tables prepared by him which, after careful study, will show that a material saving of time can be had by the use of these tables to obtain weights of galvanized or black iron ducts at different gauges used in building construction.

Complete tables have been compiled by Mr. Lippe, giving weighs of all reasonable sizes of ducts in various gauges from 26-gauge galvanized iron to 10-gauge black iron inclusive, and are being put on the market for distribution to purchasers at a price of $5.00 a set.

Specimens of these tables are shown herewith.

Lippe's Tables for Weight of Galvanized and Black Iron Ducts.

Note—Add for waste, hangers, etc.

Example: For a duct 20″ x 20″ of 24 gauge, add 20″ + 20″ = 40″. Look under 24 gauge opposite 40 under heading of *two sides,* and read 8.09. This is the weight of one foot of duct.

Wt. 1.16 per sq. ft. Two sides	No. 24 G. I. Wt. per lin. foot
10	2.02
12	2.41
14	2.83
15	3.04
16	3.23
17	3.42
18	3.61
19	3.82
20	4.04
21	4.23
22	4.42
23	4.63
24	4.81
25	5.09
26	5.29
27	5.49
28	5.67
29	5.87
30	6.07
31	6.25
32	6.45
33	6.64
34	6.83
35	7.08
36	7.22
37	7.51
38	7.63
39	7.89
40	8.09
41	8.27
42	8.47
43	8.67
44	8.85
45	9.05
46	9.25
47	9.43
48	9.63
49	9.92
50	10.11
51	10.3
52	10.49
53	10.69
54	10.87
55	11.07
56	11.27
57	11.44
58	11.65
59	11.85
60	12.03
61	12.32
62	12.52
63	12.71
64	12.91
65	13.1
66	13.29
67	13.48

Wt. 1.16 per sq. ft. Two sides	No. 24 G. I. Wt. per lin. foot
68	13.67
69	13.87
70	14.06
71	14.25
72	14.45
73	14.74
74	14.92
75	15.12

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How to Make a Stone and Concrete Flashing.

Occasionally wide copings or other places are encountered where a metal or flash is required and no material at an ordinary cost can be found wide enough. This necessitates the material in stock being used lengthwise and a provision must be made for securing the side seams. This may be done by drilling or making wedge holes with a chisel where needed. These holes may be run full of liquid solder, to which cleats may be soldered for holding the sheet material.

The sides, or rather the end of the flash, may be fastened by drilling holes with a slight downward slant into which wooden plugs are made to fill or wedge. Several notches may be cut into the back end of these plugs. Run a little hot lead into the holes and drive the plug into it immediately. Then it will be ready to receive the nail which can be driven through the metal and into the plug to secure the end of the flash. Of course measurements are taken for the proper location of these holes, which may be as close together as desired. When a wooden strip is used over the edge of the metal, as in flashing the sides and end of a roof for a building the plugs need not be as numerous.

Written especially for American Artisan and Hardware Record by L. S. Bonbrake, County Hospital, Peoria, Illinois.

A fellow can keep his own batting average and make the world a little more cheerful by laying down an occasional sacrifice hit.

Notes and Queries

"Beaumont" Lawn Mower.

From Guarantee Hardware and Furniture Company, 117 North Second Street, Stevens Point, Wisconsin.

Will you kindly inform us who makes the "Beaumont" lawn mower, as we desire to secure repairs for it.

Ans.—This is the private brand of the John Pritzlaff Hardware Company, 51 West Water Street, Milwaukee, Wisconsin, who are jobbers for it.

Corrugated Zinc for Soda Fountains.

From Wallace Sheet Metal Works, 7250 Cottage Grove Avenue, Chicago, Illinois.

Please advise us where in Chicago we can buy corrugated zinc suitable for use on soda fountains and back bars.

Ans.—Mineral Point Zinc Company, 140 South Dearborn Street.

Auto Tools.

From E. J. Hanan, 3520 East 25th Street, Minneapolis, Minnesota.

I should like to know who makes auto tools.

Ans.—F. L. Curfman Manufacturing Company, Maryville, Missouri; Helwig Manufacturing Company, St. Paul, Minnesota; Rhodes Manufacturing Company, Grand Rapids, Michigan, and Gemco Manufacturing Company, Milwaukee, Wisconsin.

All Metal Screen Frame.

From Ig. Koerner and Sons, 124 West Main Street, DuQuoin, Illinois.

Kindly let me know who makes an all metal screen frame for residence full length of window.

Ans.—The Fred J. Meyers Manufacturing Company, Hamilton, Ohio; Acme Metal Manufacturing Company, 1211 North Clybourn Avenue, Chicago, Illinois, and F. P. Smith Wire and Iron Works, 2346 Clybourn Avenue, Chicago, Illinois.

Power Driven Lawn Mowers.

From R. H. Vandevelde, Post Office Box 33, Dyersburg, Tennessee.

Plase tell me who makes power driven lawn mowers.

Ans.—Coldwell Lawn Mower Company, Newburgh, New York; Ideal Power Lawn Mower Company, 11 East Harrison Street, Chicago, Illinois, and Philadelphia Lawn Mower Company, 3101 Chestnut Street, Philadelphia, Pennsylvania.

Tinning Outfit.

From Atlantic Sheet Metal Works, Atlantic, Iowa.

Will you kindly inform us who makes a retinning outfit for retinning milk cans, ice cream cans, etc.

Ans.—Callender Soldering Process Company, 14 South Jefferson Street, Chicago, Illinois.

Bronze Thresholds.

From L. R. Hamman, 347 East Main Street, Decatur, Illinois.

Where can I get bronze thresholds 1/8 x 3 x 44 inches?

Ans.—The Fred J. Meyers Manufacturing Company, Hamilton, Ohio, and Newman Manufacturing Company, 420 Elm Street, Cincinnati, Ohio.

Toy Motors.

From E. S. Harrison, 814 John Street, Sault Ste. Marie, Michigan.

Please advise me who makes toy motors.

Ans.—H. K. Toy and Henley Skate Company, Richmond, Indiana; Interstate Electric Novelty Company, 104 South 4th Street, New York City, and Knapp Electric and Novelty Company, 511 West 51st Street, New York City.

Address of U. S. Wind Engine and Pump Company.

From Frederick H. Lord, Belle Haven, Virginia.

Can you tell me where the U. S. Wind Engine and Pump Company is located.

Ans.—Batavia, Illinois.

"Monarch" Fireplace Grates.

From G. O. Sapp, Tallula, Illinois.

Please inform me where we can purchase Monarch fireplace grates.

Ans.—These are made by the Peerless Manufacturing Company of Louisville, Kentucky, and can also be purchased from Colonial Fireplace Company, 4611 West Roosevelt Road, Chicago, Illinois.

Lead Coated Sheets.

From Georg A. Rheinisch, Sidney, Ohio.

Please tell me who manufactures lead coated long flat sheets.

Ans.—American Rolling Mill Company, Middletown, Ohio, and Merchant and Evans Company, 347 North Sheldon Street, Chicago, Illinois.

Genuine cooperation is so rare as to be noteworthy.

Tools and Completed Furniture Made with Them Attract Thousands of Pedestrians to Kelly-Duluth Company Store.

"Raft" of Tools Sold During State Hardware Convention at Duluth, Minnesota, with Artistic Tool and Furniture Window Display.

A CARPENTER'S and builder's tool window is always timely, but particularly so when the season is at its height, which has been so extended in the last few years that it is, in fact, almost impossible to distinguish the dividing line. Builders now arrange their work so that inclement weather has little or no effect upon their work.

In the accompanying illustration is seen an excellently arranged tool window display made by M. E. Klasky for the Kelley-Duluth Company, Duluth, Minnesota.

This window was put on during the state hardware convention and, as is seen, was devoted entirely to tools and furniture.

The unique feature of this display is the joint use of tools and the various articles of furniture made with the tools.

This window display will attract not only carpenters and artisans in woodwork, but also the mothers and fathers of school children who are bound to be extremely interested in the work which their children are turning out in school. It is also an inspiration to the children themselves, as it aids them in visualizing the completed work during its intermediate stages and makes the objective toward which they are working more clear.

This is an excellently arranged window display, and the owners of the store and the designer of the window are to be commended upon it.

Window Display Arranged by M. E. Klasky, for the Kelly-Duluth Company, Duluth, Minnesota, Successfully introducing the Unique Feature of Displaying Tools and the Furniture Made With the Tools.

Ball Game and Clam Bake for Manhattan Hardware Men Deur's Park, September 6.

The twelfth annual outing of the Hardware and Supply Dealers' Association of Manhattan and Bronx Boroughs, Inc., New York City, will be held on Thursday, September 6, at Deur's Park, Whitestone Landing.

Boat will leave the pier at foot of East 21st Street at 9 o'clock sharp. No other stop. Cigars, sandwiches and refreshments will be served on the boat. On arrival at the park, breakfast will be served. During the afternoon there will be a baseball game between the wholesale and retail salesmen, also bowling, swimming, foot races and numerous other games. At 5 p. m. a regular Rhode Island clam bake will be served.

The committee and members cordially invite all their friends in the hardware and kindred lines to be with them with the assurance that no effort will be spared to make it a pleasant day for all.

Rules of Three That Are Good to Keep.

Three things to govern—temper, tongue and conduct.

Three things to cultivate—thrift, industry and promptness.

Three things to give—alms to the needy, comfort to the sad, appreciation to the worthy.

Suggestions That Will Go a Long Way Toward Making Fall Sale of Enameled Ware Success.

Alden D. Graff Offers Several Ideas That Should Prove Helpful for the Coming Fall's Selling Campaign.

THERE was a time (how long ago?) when the utmost a live hardware or housefurnishings man "could do" to sell kitchen utensils was to have a "Spring Sale" and a "Fall Sale." On these solemn occasions the price cards all ended in "9" cents.

Now, there is no denying that there is a magical appeal for women in anything which looks like a bargain and there often are big sales in odd prices—but it has been discovered that they are not all there is to putting over a fall sale. After all, price selling is rarely more than one time selling—the customer comes in when the price is attractive and does not come in when there is no such attraction. But selling which is based on service and which uses a little imagination builds patronage and makes a store mean something to the women who use it.

So nowadays a successful fall sale is something more than merely a fall sale—it has a "reason for existence" and a reason why customers should flock to it. And the big idea is usually not simply bargain prices.

There are really three angles to a sale—using the word "sale" in the sense of a special featuring of certain goods rather than in the price sense. And these general ideas are just as good for spring sales as for fall sales and for other lines as well as for enameled ware. You might almost call them three steps:

1. Give your sale a dominant idea—a reason.
2. Give your sale a catchy name based on the idea.
3. Do all your advertising, window and counter displaying and sales talking in the same spirit as this idea.

There are, of course, plenty of logical reasons for a fall sale, and out of these can come the big idea. There is the fact that people are coming back from their vacations and visits. Many people are moving into new houses or apartments—and a great many more are having their places "done over." Many housewives give their houses a good fall cleaning—perhaps more than in the spring—before the furniture covers are taken off and the hangings put up and the winter "social season" begins. And many women who have been getting along on the lightest possible cooking during the summer get ready for the heavy work during

An Effective Arrangement of Enameled Ware Which Is Easy to Carry Out.

the winter.

Every one of these facts offers at least one good idea for a fall campaign on enameled ware and other kitchen equipment. For instance, instead of the commonplace name "Fall Sale," the catchier one of "Welcome Home Sale" has proved much more effective in expressing the spirit of a store and attracting customers. The very name has in it the quality of a slogan which tells of the service and the personal touch in a store's transactions.

"Fall Cleaning" or "Fall Renewal" are also good names for a sale—they work right into the activities of the housewife at this season and they tie the goods sold right up to the logical use for them at the logical time. Not only should the cooking utensils be featured but a special display and sale of cleaning utensils should prove particularly timely—enameled ware pails, basins and soap dishes, as well as galvanized goods, woodenware, brooms, mops, cleaners, ammonia, etc.

With the coming of cooler weather and heartier eating special attention should be paid to such enameled ware utensils as the roasters, pie plates, pudding bowls, larger size stew pots and kettles for such popular foods as cranberries.

There is, therefore, no reason why either the windows or the advertising of a fall sale should be tame or vague, or merely list or show articles and prices. The advertising should talk about the fall use of enameled ware as if the writer knew just how it is used—it should point specifically to fall cleaning or more active cooking—it should appeal to the housewife as being "sensible."

Circulars and booklets through the mail and telephone calls can be used with particular success on such occasions. General circularization of all customers on your mailing list will bring good returns, but special efforts on special prospects, as has been proved time and again, will bring even better returns. Some good names to get for this purpose are: (a) A list of people moving into town or moving into new houses (these can be obtained from friendly real estate agents); (b) A list of people who are coming back from vacations or long vists (these can be obtained from the personal and society columns of the newspapers); (c) The June and fall bride list (which you probably have)—as these new housewives have probably had time to find out what their kind friends forgot to give them.

A form letter for each of these groups and a circular, perhaps, should draw very gratifying returns. Telephone calls on those who are already your customers are in order, and if properly handled, probably produce better results than any other method.

A catchy name for a sale which can be used at this season is the "Pot Luck" sale. With this as a title all kinds of novel ideas can be brought in—like putting smaller utensils, strainers, cups, small pots, etc., in large ones like roasters, pails, etc., and putting a price tag on them. The word "luck" can be played up as in "cooking luck."

The fall gives the window man plenty of chances for attractive displays. There are all the fall colors, gold, red, brown, green, tan, yellow. There are autumn leaves and twigs. Outing equipment and hiking things can be put in. A corner of the window can be devoted to things for fall cleaning—another corner to utensils used in the preserving of fall fruits and vegetables.

The accompanying illustration gives a suggestion for an eye-catching display. It involves only simple shelving and some autumn foliage—and a good selection of enameled ware. Behind the shelves and on them is crepe paper and each strip can be of one of the different fall colors mentioned.

Marquette Hotel, St. Louis Headquarters, 1924 Missouri Retail Hardware Association Convention.

The 1924 convention of the Missouri Retail Hardware Association will be held at the Marquette Hotel, St. Louis, Missouri, February 26 to 28. This conclusion was arrived at during a recent meeting of the Executive Committee.

F. X. Becherer, 5106 North Broadway, St. Louis, Missouri, is the Secretary of the Association.

Van Camp Father and Son Pass On—Board of Directors Elect Successors.

With the death, which occurred on August 7th, of Cortland Van Camp, President and founder, not only the Van Camp Hardware and Iron Company suffers a loss, but the many other enterprises with which he was identified and the city of Indianapolis as well.

The hardware business of which he was the head was founded in 1876 with a very small beginning and has grown not with mushroom rapidity, but with a steady, healthy growth, until today it is said to be the largest jobbing institution in Indiana and a fitting tribute to the wisdom of his policy of correct business methods and fair dealing.

He was also interested with his father, Gilbert Van Camp, in the produce business which was the nucleus from which the Van Camp Packing Company was formed.

The Indianapolis Southern Railroad, of which he was a director, was originated by Mr. Van Camp and other associates.

He was a charter member of the Board of Trade had been identified with every association and movement tending to make it a bigger and better Indianapolis.

Mr. Van Camp was a most exemplary man, a Christian gentlemen, devout member and supporter of his church, generous in his charities, but without ostentation in his giving.

The death of his son, Samuel G. Van Camp, one of the Vice-Presidents of the company, occurred one month previous. S. G. Van Camp had not been active in the management of the company for some time, having been a semi-invalid for the past six years. He had, however, from the time he left college been associated with his father in the management of the company.

His death occurred July 5th in

New York City on his return from Paris, where he with his family had gone in the hopes that the treatment of specialists might restore his health. Like his father, he was a public-spirited citizen, anxious always to further the interests of his community.

At a directors' meeting, held August 17th, the following officers were elected: President, R. P. Van Camp; Vice-President, E. Van Camp Martindale; Vice-President, C. J. Prentiss; Vice-President, C. B. Crets; Secretary and Treasurer, A. B. Caldwell; Assistant Secretary and Treasurer, G. E. Varney.

The same progressive methods and business policies pursued in the past to which it owes its present enviable position in the mercantile world will be continued in the future under the management of Mr. Van Camp and his associates.

Moore Self-Cleaning Rake to Be Made and Sold by Johnson Gas Appliance Company.

The Johnson Gas Appliance Company, Cedar Rapids, Iowa, announces that it has taken over the manufacture and sale of the Moore Self-Cleaning Rake.

On July 1st this Company acquired all equipment, stock, patent rights, etc., of the Moore Self-Cleaning Rake Company, Cedar Rapids. Its modern factory, with special new equipment, will insure a product of quality and durability.

In addition to the patented Self-Cleaning Rake the company will manufacture a common steel garden rake, which also has patented features, and a sidewalk scraper.

Production will begin at once, it is announced, and orders can be filled within thirty days.

Coming Conventions

Joint Committee on Standardization of Registers will meet at Waldorf-Astoria Hotel, New York City, Tuesday, September 4. Chairman, R. W. Menk, Excelsior Steel Furnace Company, Chicago.

Automobile Accessories Branch National Hardware Association, Hotel Shelburne, Atlantic City, New Jersey, October 15 to 19.

The National Hardware Association and the American Hardware Manufacturers' Association, Atlantic City, New Jersey, October 16, 17, 18 and 19. F. D. Mitchell, 1819 Broadway, New York, is Secretary and Treasurer of the Manufacturers; T. J. Fernley, Secretary of Jobbers.

The twenty-fourth annual convention of the National Federation of Implement Dealers' Associations will be held at Hotel Sherman, Chicago, October 17, 18 and 19, 1923. H. J. Hodge, Abilene, Kansas, is Secretary.

Mountain States Hardware and Implement Association Convention, City Auditorium, Denver, Colorado, January, 1924. W. W. McAlister, Secretary-Treasurer, Boulder, Colorado.

Western Retail Implement and Hardware Association, Missouri Theater Building, Kansas City, January 15, 16, 17, 1924. H. J. Hodge, Secretary-Treasurer, Abilene, Kansas.

The West Virginia Retail Hardware Association, Convention and Exhibit, Huntington, West Virginia, January 15 to 18, 1924. James B. Carson, Secretary-Treasurer, 1001 Schwind Building, Dayton, Ohio.

Kentucky Hardware and Implement Association, Louisville, January 24-25, 1924. J. M. Stone, Secretary-Treasurer, 202 Republic Building, Louisville.

Indiana Retail Hardware Association, Inc., Convention and Exhibition, Cadle Tabernacle, January 29, 30, 31, February 1, 1924. G. F. Sheely, Secretary, Argos.

Nebraska Retail Hardware Association, Lincoln, Nebraska, February 5 to 8, 1924. George H. Dietz, Lincoln, Nebraska, Secretary-Treasurer.

Wisconsin Retail Hardware Association Convention and Exhibition, Milwaukee Auditorium, February 6, 7, 8, 1924. George W. Kornely, Manager of Exhibits, 1476 Green Bay Avenue, Milwaukee. P. J. Jacobs, Secretary-Treasurer, Stevens Point.

Michigan Retail Hardware Convention and Exhibition, Grand Rapids, February 12, 13, 14, 1924. Karl S. Judson, Exhibit Manager, 248 Morris Avenue, Grand Rapids. A. J. Scott, Secretary, Marine City, Michigan.

The Pennsylvania and Atlantic Seaboard Hardware Association, Incorporated, convention and exhibition at the Philadelphia Commercial Museum, Philadelphia, Pennsylvania, February 12, 13, 14 and 15, 1924. Sharon E. Jones, Secretary-Treasurer, Wesley Building, Philadelphia.

New York Retail Hardware Association Convention and Exhibition, February 19, 20, 21, 22, 1924. Headquarters, McAlpin Hotel, and Exhibition at Seventy-First Regiment Armory. John B. Foley, Secretary, 412-413 City Bank Building, Syracuse.

The Ohio Hardware Association, Convention and Exhibit, Cincinnati, Ohio, February 19 to 22, 1924. James B. Carson, Secretary-Treasurer, 1001 Schwind Building, Dayton, Ohio.

The Missouri Retail Hardware Association, Convention and Exhibition, Marquette Hotel, St. Louis, Missouri, February 26, 27 and 28, 1924. F. X. Becherer, Secretary, 5106 North Broadway, St. Louis, Missouri.

Retail Hardware Doings

Alabama.

A new concern, the Sylacuga Hardware Company, has been opened at Sylacuga.

California.

The Norwalk Hardware store have opened for business in the new Greening Building on First Street, Norwalk.

S. R. Frizelle and H. W. Hamman have purchased four lots opposite the postoffice at Chowchilla and will erect a concrete block building 50 by 100 feet and put in an up-to-date hardware and house furnishing stock of goods.

The Chappell Hardware Company at Gilroy has dissolved partnership. The hardware, crockery, wall paper, and household department has been taken over by the Gilroy Hardware Company, with Charles Holman as manager. George A. Chappell and his two sons have charge of the implement, plumbing, and sheet metal departments.

Illinois.

In connection with their hardware store, Garnier Brothers of Centralia have fitted up a modern tin and radiator shop.

Indiana.

Drissler and Albright, hardware dealers in South Bend for twenty-six years, have sold out to Frank Heath and Frank Cearns. The new concern is known as Heath and Cearns.

Iowa.

Roy Shupe has traded his hardware stock at Milo to a Mr. Thompson of Creston, for a farm near Leon, Iowa.

The Grain Hardware Company have sold their branch hardware store in Martinsburg to Harry White of Oskaloosa.

Kansas.

J. T. Fitzgerald has disposed of his interest in the Fitzgerald Hardware Company at Colby to his son, Gerald, and his son-in-law, Arthur W. Hamill.

Michigan.

The hardware firm of McIllwain and Curtis at Homer has dissolved partnership. Mr. McIlwain has purchased the interests of his partner and will continue the business.

Stroebel Brothers have sold their hardware stock in East Jordan to Charles F. Neitzel of Detroit.

W. C. Wolverton has purchased the hardware store and stock of the Gundry Hardware Company at Fenton.

Levi Blough has purchased of Abraham Snyder, Sr., and son, Abraham Snyder, Jr., Vestaburg, their stock of hardware goods.

Nebraska.

T. W. Johnson has sold the Johnson Hardware store at Norfolk to Harold Hales and William Osborn of Tilden. The new firm is known as Hales and Osborn Hardware.

Ohio.

The hardware store owned by Postmaster J. M. McGough at Harrod has been destroyed by fire.

South Dakota.

Edrich's new hardware store is open for business at Hoven.

The Claire City Hardware Company, Claire City, has been incorporated with a capital of $5,000. Incorporators are: Herold Sombak, Herman Wenschlag, and Mary V. Sombak.

Wisconsin.

The Wehrman Hardware Company has opened for business at 1303 Superior Avenue, Sheboygan.

Richard Haase of Neenah has purchased a retail hardware store at Prentice.

The Little Red Wheel Celebrates Tenth Anniversary of Its Discovery.

B. E. Meacham Tells How He Came to Invent the Now Famous Lorain Oven Heat Regulator.

IN THE following interesting article B. E. Meacham tells how he came to invent and develop the Lorain Oven Heat Regulator, which has almost caused a revolution in gas cooking methods and which has, incidentally, helped to increase the sale of gas ranges in a wonderful manner.

Mr. Meacham is now Superintendent of the National Stove Company Division of the American Stove Company.

The article follows:

As I look back over the years of my life, and then attempt to visualize the future of the Lorain Oven Heat Regulator, I wonder just what would happen if all mothers, fathers, friends and employers realized the great responsibility that rests upon anyone who in one way or another commands the acts, thoughts and time of other human beings.

Personally, I have never been able to make myself believe that any great amount of credit is due me for the invention of the Lorain Oven Heat Regulator. In fact, I am postive that I am entitled only to a small share of the credit, the greater part being due my mother and the circumstances that surrounded my boyhood days; to Dr. Andrew Ure, the inventor of the thermostat, and to my employers who so kindly gave me the opportunity necessary to develop and perfect my idea.

I was born and brought up on a farm near Norwalk, Ohio, being the eldest child of a family of seven. There may be many men who will read this article who also were the eldest of large families in ordinary circumstances. Such readers need not be told that I was the "hired girl" without pay, except for the great kindness and consideration of a loving mother and father.

Although my mother, like most women of her day who lived on farms, assisted with the farm work, and although she kept our home scrupulously clean, I believe the labor which took most of her time and which seemed always to worry and wear her down was the cooking of three meals a day for that hungry family of seven.

And so I forgive and even praise my mother for teaching her oldest son at an early age how to cook and bake many simple, easily prepared dishes. And, frankly, I cannot say that I disliked the task. I believe that all men have much of the gambling spirit in them and cooking in those days was about 90 per cent gamble.

But mother never seemed to enjoy the gambling part of baking and getting meals. Knowing full well the limit of the family pocketbook, she got anything but a thrill from taking a chance with several loaves of bread or cake in the oven of that old coal range that did so many strange things and always unexpectedly.

It bothered me the way mother would worry after she placed something in the oven. She'd fuss with the fire, turn dampers, peek into the oven, and actually be afraid to leave the kitchen for more than a moment or two.

I remember particularly a time when we were harvesting. Sixteen big-belted and broad-chested men working in the hot sun with sweat trickling down their red faces were creating an appetite that would daunt the animal feeders of a three-ring circus.

Yet mother, working in the kitchen with little assistance, was, in proportion to her strength, giving more of her energy than those sixteen men. Mother was baking bread for those husky workers in addition to cooking the dinner—*and the bread burned!*

I'll never forget the look of real mental anguish and physical exhaustion that came over her face as she gazed at the ruined loaves, and right then and there I made a promise to myself that some day I would invent *"something"* that would pre-

Let Lorain be your Chef Thanksgiving Day
THANKSGIVING, the day of the world's greatest "at home" party!
This year let's go to the morning football game. But how can we all go? Must not someone remain behind in the hot kitchen to prepare the great spread for the family—Roast Turkey and all the other "good things!"
NO! This year we all can go, for "Lorain" will be our chef Thanksgiving Day. The Lorain Oven Heat Regulator will cook your dinner as perfectly as any master chef—while you're miles away!
You can place all the good things in the oven, turn the Red Wheel to 250 degrees and go away for four or five hours. When you return, everything will be deliciously done and ready to serve.
Come in and see how easy this is done in a gas range equipped with the "Lorain." Ask us to explain its many marketable advantages.
CLARK JEWEL Gas Range
Dealer's Name and Address
An old-fashioned dish improved by a new cooking method
AND roast pig is not the only dish cooked with less labor and made more delicious by Lorain time-and-temperature cooking.
Everything for which you use the oven will be improved through the exact heats placed at your command by the Lorain oven regulator.
LORAIN OVEN HEAT REGULATOR
CLARK JEWEL GAS RANGES
We are showing this celebrated gas range in a variety of styles, large and small. All are equipped with the Lorain Oven Heat Regulator, which is endorsed by Good Housekeeping Institute, domestic science experts, and thousands of women who know its benefits.
Come in and see it now. We'll be interested to know what you think of Lorain whole-meal cooking.
Dealer's name and address

Typical Newspaper Advertisements Furnished to Stove Merchants in Electrotyped Form.

vent mother's bakings from burning.

In the course of time I became an employe of the National Stove Company Division of Lorain, Ohio, and as the years rolled by I gained promotion after promotion, until finally I was entrusted with the responsible position of Superintendent of the factory.

At that time, 1913, the Company was manufacturing automatic hot water heaters as well as gas ranges, and I had been experimenting with various types of thermostats in order to get a basic idea from which I could develop one that would be superior to all others.

While sitting and pondering one day with a hot water thermostat in my hands I found my vision concentrated upon a new model of a gas range. Instantly almost, and for no reason that I have ever been able to figure out, I recalled my promise to do something to keep mother's bread from burning—and immediately something within me told me that I had the answer in my hand.

Sitting there and thinking, I soon realized that there were many things to do before a thermostat could be made a commercial proposition as an attachment to a gas range.

Thermostats made for hot water heaters require only a narrow range of temperatures. If a thermostat was to be made for regulating cooking temperatures, it would be necessary to have a wide range of different heats. There was also the problem of application to the gas range and that wasn't so simple as it sounds.

Then again, the device must be made as inexpensive as possible and yet give the greatest possible degree of accuracy. Also, it must be simple in construction and fool-proof in operation.

At this point of my story I must give credit to my employers. The idea was radical, to say the least, and there are many, many concerns, both large and small, that turn down everything but "sure thing bets" without the least investigation or consideration.

My employers, however, gave me every opportunity and assistance to develop my idea, and within a few weeks I had built a working model. Right here let me say that so *carefully* was the whole proposition planned, worked out and constructed that *the regulator of today is practically identical with that early model.*

In the very first tests the temperature of the oven was found to register correctly with the figure indicated by the metal pointer on the regulator wheel—and a very accurate high temperature thermometer was used in the test, too. But there must be something wrong, I thought. We men in engineering experimental work are not accustomed to hitting the nail on the head the very first tap.

So it was decided to make a practical endurance test and the job was given to my wife, Mrs. Meacham. For one and one-half years Mrs. Meacham experimented with that first regulator, and many unusual, interesting and amusing things occurred during that time, because, you see, like a hunter in an unexplored jungle, she had absolutely nothing to guide her.

But by trial after trial she learned the temperatures at which certain dishes cooked best and also the lengths of time required to cook them in the oven. She was the first to use the alarm clock in connection with the regulator.

I remember one occurrence when some friends called at our home and detected the appetizing odor of bread being baked. The woman in the party soon suggested that they must not stay long because Mrs. Meacham undoubtedly wanted to watch her bread so that it would not burn.

Mrs. Meacham looked at the clock and said, "Don't worry, the time's not up yet." The astonished visitor exclaimed, "Don't you watch your bread while its' baking?" "Not any more," replied Mrs. Meacham. "You see, Mr. Meacham has placed a device on my stove that takes care of all that. I just put my bread in the oven, turn a small wheel until a hand points to a certain degree of temperature, which means that the oven is just so hot, and then I do what I please until time's up. I never have trouble any more with things being underdone, overdone or burned."

The visitor begged to see the stove, and, upon seeing a practical demonstration, remarked: "I wonder if your husband could fix my stove the same way. I think it's the most wonderful thing I've ever seen."

This remark fired my enthusiasm. Here, for the first time, was the expression of an outside opinion on the regulator—and from a woman, too—for it would be women who would buy and use and recommend such a device. You see, I didn't place a very high value on Mrs. Meacham's enthusiasm—all good wives consider it a duty to flatter the pay-envelope half of the family!

But this friend of the family was really sincere in her desire to own a gas range equipped with a regulator, and right away I had a vision of what would happen if thousands of women all over the country gathered together and heard for the first time the wonders of this little device. But my vision, big as it seemed to me at that time, could not compare with what has actually happened.

And this is the story of the Lorain Oven Heat Regulator, named after the city of its birth. As one of the greatest benefits ever created to save the time, work and worry of women, I feel that it owes its conception to a woman.

That it was given to mere man to work out the details is a pleasant thought to me. And I believe that all who read this story will agree that the world owes a perpetual debt to its mothers.

It is not a hard matter to keep your credit good. All that is necessary is to take a few precautions, and observe in general the principles of good business. The first requisite is, of course, to accept no more credit than the business will stand. Sometimes it is possible to secure enough credit to ruin a business.

An Advertisement Must Attract, Interest and Convince the Prospect That Your Goods Are Necessary to His Welfare.

To Do This it Should Be So Designed That All of Its Component Parts Will Work Together Toward the Ultimate Result.

Advertisers of every type are of the opinion that the use of white space in the advertisement is beneficial; that ads overcrowded with small type are uninviting and do not have the pulling power of the ad using easily readable type. Department stores, however, are generally considered an exception; these stores continually run full-page spreads, offering many different articles. Where the entire page is used, however, there is nothing surrounding the ad which would act as a distraction, therefore these ads would be an exception.

Yes, It Pays to Buy Tires and Accessories at Rayl's
SUPERIOR FLAT TREAD CORD TIRES
Superior Flat Tread Cord Tires
Almost every day somebody tells us about their Superior Cords having gone 15,000 to 18,000 miles and more and still looking good. Superior cords don't rim-cut. Every cord is completely insulated from every other cord with pure gum rubber, thus eliminating internal friction.
THEY WEAR BETTER
THEY LOOK BETTER
THEY ARE BETTER
—And They Cost No More
10,000 Mile Guarantee By Rayl's
30x3½ Clincher Cord $11.95
30x3½ Straight Side Cord.. $13.50
31x4 Straight Side Cord.. $22.75
32x4 Straight Side Cord.. $24.05
33x4 Straight Side Cord.. $24.75
33x5 Straight Side Cord.. $37.15
Free Can of Patching Material
All you have to do is ask for it when making your purchase in the accessory dept.
Spot and Trouble Light
Black enameled with nickel trimmings. Snap twist type switch. Set screw focus. Long cord. Can be easily detached for shooting trouble in dark. The best buy at..... $2.59
Stop Overheating Your Ford
Put on a "Flood" Water Circulating Pump
"Floods" powerful suction propeller empties a radiator full of cool water through your Ford motor once every minute at a car speed of 20 miles per hour, impossible to heat up your Ford with a Flood pump on it. Keeps the motor temperature at the point of most efficiency. You can install it yourself in 20 minutes. SPECIAL PRICE FOR THIS WEEK $4.50
SPEE DEE MECHANICS' SOAP
Takes off the grease in a hurry. Won't chap the hands 25c
Oblong Stop Signal $1.79
Back Cushions
Wedge shaped. Covered with fabricated leather. Just the thing to make driving comfortable for the chap whose legs are too short to reach the pedals comfortably..... $1.19
Fisher Grease Gun
Has a scoop arrangement for quick filling. Gets in the out-of-the-way places. A $1.50 value for..... 79c
A NINE-POUND LUGGAGE CARRIER, made of very heavy material and heavily japanned, making it rust proof. Special at..... $1.09
Made by the builders of the famous Protex Signals—the best on earth. Black will not come off lens. A $2.50 value, at $1.79
Nelson Timer for Fords
Anti-friction ball bearing roller brush—no small, high speed roller to wear out or stick on its bearing and cause trouble. Guaranteed 100,000 miles $3.50
Rear View Mirror $1.98
A very high grade mirror—10 inches long—has a patented ball and socket bracket for fastening on either open or closed cars. A $2.75 value for..... $1.98
RAYL'S
GOOD HARDWARE SPORTING GOODS
9 GRAND RIVER EAST, AT WOODWARD

In the smaller departmentized ad, however, great success has been attained by graduating the type and assisting the reading matter and the headline with ample illustrations.

In an ad of this type, the general practice is to have a one or two-line head across the top of the ad. This should be made of large type and should be designed to attract attention. Each department should have a subhead made of smaller-sized type than that used in the headline. The explanatory reading matter should be brief and to the point and should contain the price. A brief explanatory note, the illustration and the subhead should be so designed as to concentrate attention. In this way, when attention has once been directed toward the particular department, the reader will have digested its content before going on.

The accompanying ad is reprinted from the Detroit, Michigan, *Times*. The department idea is carried out in this ad to a good degree and aside from a few typographical errors, the entire ad is good. It will be noted that although the ad offers several articles, they all pertain to the same object; namely, a car which tends to concentrate attention to a high degree.

Truth in advertising has come to stay. It is nowhere more vital than in publicity designed to sell goods.

The greatest enemy of truth is half truth in its various forms—exaggeration, understatement and misleading pesentation of facts.

Truth begets confidence. Half truth breeds suspicion, which grows into disbelief.

In the primitive forms of trading the callous principle prevails: "Let the buyer beware." In enlightened commercial intercourse the guiding principle is: "Let the buyer *believe*."—*Commerce Reports.*

Summer Business Slow-up Wanes; Activity in Fall Buying Increased—Freight Movements Show Decrease.

Non-Ferrous Metal Markets Show Decided Firmness; Labor Troubles in Zinc Industry Cause Curtailed Production.

DIGEST of business conditions issued by the Continental & Commercial National Bank, Chicago, says: "The farmer, his crops, and the marketing of them are not going to interfere with the orderly development of the business cycle or interrupt the continuity of business activity. The farmer did not create the expansion of business and while it is unfortunate that he has not participated as fully as others, his position is improving. But, however the farmer may fare, he is not going to put an end to a condition he did not create. The continuation of business activity is not dependent on agriculture to any degree and agriculture is well enough off to contribute something to the continuation."

The mid-week reviews of the steel and iron industry deal chiefly with possible effects of establishment of the eight hour day.

"The change to the short day is not yet a market factor, though it is expected to be a stabilizer, in view of added costs and somewhat lessened output," the *Iron Age* says. "The new regime has increased the uncertainties of the outlook. While buyers concede that it tends to sustain prices, the policy of many of them is still to avoid forward contracting. Labor supply on the whole has been greater than was expected."

Copper.

A firm undertone is exhibited in the copper market. Producers state that they can sell all of the metal they wish at 14 cents a pound for electrolytic delivered.

From all appearances, this is now the lowest price obtainable. Copper exports through the port of New York so far this month total 26,996,480 pounds, and indications point to a total outward movement of some 40,000,000 pounds for the month of August. Imports in June were close to 64,000,000 pounds, which brings the total for the first half of the year up to 302,400,000 pounds. Imports for the first six months of the year averaged about 50,400,000 pounds a month, as against an average exportation of very nearly 61,410,000 pounds (including finished shapes) per month. Lake copper is quoted at 14¼ cents delivered, while casting is bringing 13¾ cents a pound refinery.

The price of copper burrs has declined recently, the new discount being 40%.

Tin.

Another advance was registered in tin. The increase in this market amounted to another quarter of a cent a pound.

In the domestic market practically all deliveries and positions of Straits and Straits shipments closed a quarter of a cent higher at 39½ cents, and, while in some quarters the premium of a quarter of a cent was still asked for spot, in others this position was available at the same price as futures.

Lead.

The lead market is much firmer than last week, due, no doubt, to the improved demand and larger inquiry.

The fall buying that now seems in close prospect will find a healthy statistical position — small spot stocks and accumulation in the producers' hands.

Prompt shipment was in good demand at 6.45 cents, East St. Louis, August 22.

Quotations for August and September, St. Louis, are 6.45 cents.

Wire and Nails.

Sales of wire products during the past week at Chicago have failed to uphold the auspicious start to a fall buying movement which was apparent a week ago. Inquiry continues favorable, but actual business closed during the past week is considerably lower than it was during the previous week. Manufacturers are rapidly catching up on delivery and fairly prompt shipment of both fencing and nails can be secured at present. Prices hold firm and heavy buying is looked for about Sept. 1.

Tin Plate.

Tin plate producers are doing their utmost to clear away present obligations before opening books for the fourth quarter, but despite efforts in this direction large tonnages necessarily will have to be scheduled for October rolling.

New request is broad but until makers determine prices to govern next quarter's business not much business is being accepted other than in a tentative way.

Stock plate in the hands of some producers is practically exhausted, and with consumers taking all overage now being rolled, little promise is held for building up supplies.

At a few plants orders for certain sizes of stock plate can be filled upon which producers are holding to $5.50, base Pittsburgh.

Operations have not been curtailed to any appreciable extent and are in the neighborhood of 80 per cent of capacity. Specifications are well in hand and no letup in pressure is noted from can makers anxious to get deliveries on tonnage.

Zinc.

The good export demand for zinc which now exists is having a strengthening effect upon the domestic market. Domestic demand has been paltry for some time.

There has been a good export demand for August-September ship-

ment from western smelters at 6.45 cents East St. Louis basis, and not all that was bid for has been obtainable at that price.

Quotations for August and September are 6.45 to 6.50 cents. Those for October are 6.47½ to 6.52½ cents East St. Louis.

Solder.

Chicago warehouse prices on solder are as follows: Warranted 50-50, $25.25; Commercial, 45-45, $24.50, and Plumbers', $23.25, all per 100 pounds.

Sheets.

Activities in the sheet market still center around the discharge of present obligations. The general tendency is to quote black sheets at 3.85 cents, base Pittsburgh, though in one or two instances a price of $2 under the market is heard.

A consumer of black plate who expected delivery of his requirement this quarter has been advised that shipments cannot possibly be made. Turning to the open market, this consumer bought about 2,000 tons of black sheets, but was not successful in developing a price below 3.85 cents, base Pittsburgh.

Interest in lining up fourth quarter tonnages is growing, although prices still are to be determined. Entries of tonnage for shipment over the last three months are being made only in a tentative manner.

Sentiment in the market continues to show improvement over a week ago, due in all probability to easier credit conditions.

Blue annealed still is in active request and prices are firm at 3.00 cents, base Pittsburgh.

Inquiries for galvanized sheets also are numerous with quotations unchanged at 5.00 cents, base Pittsburgh. Operations continue to be maintained at around 80 per cent of capacity.

Old Metals.

Wholesale quotations in the Chicago district, which should be considered as nominal, are as follows: Old steel axles, $21.00 to $21.50; old iron axles, $27.00 to $27.50; steel springs, $22.00 to $22.50; No. 1 wrought iron, $15.50 to $16.00; No. 1 cast, $18.50 to $19.00, all per net tons. Prices for non-ferrous metals are quoted as follows, per pounds: Light copper, 9½ cents; light brass, 5 cents; lead, 4¼ cents; zinc, 3½ cents; and cast aluminum, 15 cents.

Interest Reviving in Pig Iron as Fourth Quarter Approaches; Effect of Three-shift System Soon to Be Known

Pittsburgh Trading Restricted to Small Lots—Chicago Sales Ahead of July—Quiet Reigns at Birmingham

"WITH the three-shift system actually in force in many furnaces and mills, the time is not far distant when the effects of the change will be known. In a number of instances the introduction of the short turn during the past week has been accompanied by sporadic walkouts and other interruptions to operations owing to misunderstandings. Until the temporary confusion, due to the sudden change dies out, it will be impossible to obtain a fair idea of normal conditions under the new system," says *Iron Trade Review.*

Likewise, it will be difficult to trace the influence of the short day on the iron and steel market until producers have had a chance to compare actual operating costs.

In ten European open-hearth plants, the change from two to three shifts resulted in an increase of production of about 7 per cent, but there also was a sharp decrease in the output per man per day and a large increase in the cost per ton.

In view of this uncertainty, the present encouraging volume of inquiries cannot definitely be attributed to the introduction of the abbreviated workday. While the volume of sales is only slightly above that of the early weeks of August, the increasing flow of inquiries points to a period of heavier buying during September. This view also is strengthened by the fact prices of pig iron, scrap and finished steel are firm.

More interest is being shown in the pig iron market as the fourth quarter approaches. Reported sales for the week approach the 50,000-ton mark while new inquiry received in that period involves more than 60,000 tons. This latter figure includes an inquiry of 5,000 tons of basic iron from a valley steelmaker.

Pig iron sales at Chicago in August already are ahead of the total for July. The total tonnage in the past week is equal to that of the previous week. All sellers hold northern iron firm at $27. Resale southern iron has been sold at $23, furnace, or $29 delivered. Current sales include 1500 tons of foundry iron to an Illinois consumer, 1000 tons of malleable and several thousand tons of foundry iron. Inquiry is out for 1000 tons of basic iron; 1000 tons of malleable; 1000 tons of low phosphorus and 1500 tons of 15 per cent bessemer ferrosilicon iron. Charcoal iron is firm at $32.04, Chicago. Sales total 500 tons. Silveries are stronger. Electrolytic plants are down on account of a lower water stage. Several Jackson county furnaces are out. The price is unchanged.

The pig iron market is very quiet at Birmingham. New business is so light that serious consideration is being given to curtailment of production and two or more furnaces may soon be blown out. It is reported that a small furnace company has offered a little more tonnage at $24 and $25, for No. 2 foundry, to be delivered during the fourth quarter. One of the larger producers of pig iron in this district sold an eastern melter a little tonnage for delivery during the next 60 days, the first sale in that direction in some time.

Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

PIG IRON.

Chicago Foundry.. 27 00 to 27 50
Southern Fdy. No. 2 ..... 29 51 to 30 01
Lake Sup. Charcoal 32 15
Malleable ..... 27 00 to 27 50

FIRST QUALITY BRIGHT TIN PLATES.

		Per Box
IC	14x20 112 sheets	$12 45
IX	14x20.....	14 05
IXX	14x20 56 sheets	17 57
IXXX	14x20.....	18 12
IXXXX	14x20.....	18 65
IC	20x28 112 sheets	27 50
IX	20x28.....	29 85
IXX	20x28 56 sheets	16 15
IXXX	20x28.....	17 20
IXXXX	20x28.....	18 25

TERNE PLATES.

		Per Box
IC	20x28, 40-lb. 112 sheets	$25 60
IX	20x28, 40-lb. " "	28 50
IC	20x28, 30-lb. " "	21 80
IX	20x28, 30-lb. " "	24 70
IC	20x28, 25-lb. " "	20 80
IX	20x28, 25-lb. " "	23 70
IC	20x28, 20-lb. " "	18 30
IV	20x28, 20-lb. " "	21 15
IC	20x28, 15-lb. " "	17 05
IC	20x28, 12-lb. " "	15 75
IC	20x28, 8-lb. " "	14 05

COKE PLATES.

Cokes, 80 lbs., base, 20x28. $14 05
Cokes, 90 lbs., base, 20x28. 14 30
Cokes, 100 lbs., base, 20x28. 14 65
Cokes, 107 lbs., base, IC 20x28 ..... 15 10
Cokes, 135 lbs. base, IX 20x28 ..... 17 15
Cokes, 155 lbs. base, 56 sheets 9 30
Cokes, 175 lbs. base, 56 sheets 10 10
Cokes, 195 lbs. base, 56 sheets 10 95

BLUE ANNEALED SHEETS.

Base .....per 100 lbs. $4 00

ONE PASS COLD ROLLED BLACK.

No. 18-20.....per 100 lbs. $5 00
No. 22-24.....per 100 lbs. 5 05
No. 26.....per 100 lbs. 5 10
No. 27.....per 100 lbs. 5 15
No. 28.....per 100 lbs. 5 20
No. 29.....per 100 lbs. 5 30

GALVANIZED.

No. 16.....per 100 lbs. $5 60
No. 18-20.....per 100 lbs. 5 75
No. 22-24.....per 100 lbs. 5 90
No. 26.....per 100 lbs. 6 05
No. 27.....per 100 lbs. 6 20
No. 28.....per 100 lbs. 6 35
No. 30.....per 100 lbs. 6 85

BAR SOLDER.

Warranted.
50-50 .....per 100 lbs..$25 25

Commercial.
45-55 .....per 100 lbs. 24 50
Plumbers ....per 100 lbs. 23 25

ZINC.

In Slabs 6 75

SHEET ZINC.

Cask lots, stock, 100 lbs... 11 00
Less than cask lots, 100 lbs. 11 50

BRASS.

Sheets, Chicago base.....21¾c
Mill Base 19c
Tubing, brazed, base.....27c
Wire, base 19c

COPPER.

Sheets, Chicago base.....22½c
Mill Base 21¾c
Tubing, seamless, base.....24c
Wire, No. 9 & 10 B. & S. Ga., ...21½c
Wire, No. 11 B. & S. Ga....21¼c

LEAD.

American Pig..... 7 00
Bar 8 00

Sheet.
Full Coils.....per 100 lbs. 10 25
Cut coils.....per 100 lbs. 11 25

TIN.

Pig Tin .....per 100 lbs. 41 12½
Bar Tin .....per 100 lbs. 42 12½

HARDWARE, SHEET METAL SUPPLIES, WARM AIR HEATER FITTINGS AND ACCESSORIES.

ADZES.

Coopers'.
Barton's .....Net
White's .....Net

AMMUNITION.

Shells, Loaded, Peters.
Loaded with Black Powder 18%
Loaded with Smokeless Powder 18%
Winchester.
Smokeless Repeater Grade .....20 & 4%
Smokeless Leader Grade .....20 & 4%
Black Powder .....20 & 4%
U. M. C.
Nitro Club .....20 & 4%
Arrow .....20 & 4%
New Club .....20 & 4%
Gun Wads—per 1000.
Winchester 7- 8 gauge 10&7½%
" 9-10 gauge 10&7½%
" 11-28 gauge 10&7½%

ASBESTOS.

Paper up to 1/16.....6c per lb.
Rollboard .....6¼c per lb.
Millboard 3/32 to ¼....6c per lb.
Corrugated Paper (250 sq. ft. to roll)....$6.00 per roll

AUGERS.

Boring Machine.....40&10%
Carpenter's Nut 50%
Hollow.
Stearns, No. 4, doz.....$11 50
Post Hole.
Iwan's Post Hole and Well 35%
Vaughan's, 4 to 9 in.....$15 60

AXES.

First Quality, Single Bitted (unhandled, 3 to 4 lb., per doz.....$14 00
Good Quality, Single Bitted, same weight, per doz. 13 00

BARS, CROW.

Steel, 4 ft., 10 lb.....$ 80
Steel, 5 ft., 13 lb..... 1 40
Pinch bars.
5½ ft., 24 lb..... 1 60

BARS, WRECKING.

V. & B. No. 12.....$0 34
V. & B. No. 24..... 0 43
V. & B. No. 224..... 0 57
V. & B. No. 30..... 0 48
V. & B. No. 330..... 0 63

BITS.

All Vaughan and Bushnell.
Screw Driver, No. 30, each $ 27
Screw Driver, No. 1, each 16
Reamer, No. 80, each... 41
Reamer, No. 100 each... 41
Countersink, No. 13, each.. 30
Countersink, Nos. 14-15 each 27

BLADES, SAW.

Wood.
Atkins 30-in.
Nos. ..... 6 $3 90 | 40 $9 45 | 26 $5 40

BLOCKS.

Wooden 45%
Patent 45%

BLOW TORCHES (See Firepots).

BOARDS.

Stove.	Per Doz.
Crystal, 33"	22 90
Wash.	
No. 760, Banner Globe (single) .....per doz.	$5 25
No. 652, Banner Globe (single) .....per doz.	6 75
No. 801, Brass King, ...per doz.	8 25
No. 860, Single—Plain Pump	6 25

BOLTS.

Carriage, Machine, etc.
Carriage, cut thread, ⅝x6 and sizes smaller and shorter 45-5%
Carriage sizes, larger and smaller and shorter....40-5%
Machine, ⅝x4 and sizes smaller and shorter.....50%
Machine, sizes larger and longer than ⅝x4.....40-10%
Stove 70-5%

BRACES, RATCHET.

V. & B. No. 444 8 in.....$4 54
V. & B. No. 222 8 in..... 3 39
V. & B. No. 111 8 in..... 3 55
V. & B. No. 11 8 in..... 3 02

BRUSHES.

Hot Air Pipe Cleaning.
Bristle, with handle, each $0 85
Flue Cleaning.
Steel Only, each.....$1 25

BURRS.

Copper Burrs only.....40%

BUTTS.

Steel, antique copper or dull brass finish—case lots—3½x3½—per dozen pairs $3 48
4x4 ..... " " " 4 74
Heavy Bevel steel inside sets, case lots— .....per dozen sets 8 00
Steel bit keyed front door sets, each 2 00
Wrought brass bit keyed front door sets, each.... 4 00
Cylinder front door sets, each 8 50

CEMENT, FURNACE.

American Seal, 5 lb. cans, net $ 45
" " 10 lb. cans, " 90
" " 25 lb. cans, " 3 00
Asbestos, 5 lb. cans " 45
Pecora.....per 100 lbs. 7 51

CHAINS.

Sher. Steel Safety Chain.
500-ft. coil, per ft..... .02
100 to 500 ft., per ft..... .02½
Less than 100 ft., per ft .03
Iron Jack Chain.
Box (12 yds.)..... .45

CHIMNEY TOPS.

Iwan's Complete Rev. & Vent. 30%
Iwan's Iron Mountain only..35%
Standard .....30 to 40%

CHISELS.

Cold.
V. & B. No. 25, ¼ in., each $0 26
V. & B. No. 25, ⅜ in., each 41
Diamond Point.
V. & B. No. 55, ¼ in..... 0 31
V. & B. No. 55, ½ in..... 0 48
Firmer Bevelled
Round Nose.
V. & B. No. 65, ¼ in..... 0 29
V. & B. No. 65, ½ in..... 0 40
Socket Firmer.
Cape.
V. & B. No. 50, ⅜ in..... 0 31
V. & B. No. 50, ¾ in..... 0 57

CHUCKS, DRILL.

Goodell's, for Goodell's Screw Drivers .....List less 35-40%
Yankee, for Yankee Screw Drivers $6 00

CLAMPS.

Adjustable.
No. 100, Door (Stearns) doz. $22 00
Carpenters'.
Steel Bar..List price plus 20%
Hose.
Sherman's brass, ¾-inch per doz. $0 48
Double, brass, ¾-inch, per doz. 1 20

CLINKER TONGS

Front Rank, each.....$1 75
Per doz. 1 85

CLIPS.

Damper.
Acme, with tail pieces, per doz. $1 25
Non Rivet tail pieces, per doz. 25

COPPERS—Soldering. Pointed Roofing.

8 lb. and heavier....per lb. 40c
2½ lb..... " 45c
2 lb..... " 48c
1½ lb..... " 55c
1 lb..... " 60c

CORD.

No. 7 Std. per doz. banks..$10 35
No. 8 " " " " 12 00

CORNICE BRAKES.

Chicago Steel Bending.
Nos. 1 to 6 B.....10%

COUPLINGS, HOSE.

Brass.....per doz. $2 25

CUT-OFFS

Kuhn's Korrekt Kutoffs:
Galv., plain, round or cor. rd.
Standard gauge 40%
26 gauge 10%

DAMPERS.

"Yankee" Hot Air.
7 inch, each 20c, doz.....$1 75
8 " " 25c, " 2 40
9 " " 30c, " 2 75
10 " " 32c, " 3 00

Smoke Pipe.
7 inch, each.....$ 35
8 " " 40
9 " " 50
10 " " 60
12 " " 90

Reversible Check.
8 inch, each.....$1 50
9 " " 1 70

DIGGERS.

Post Hole.
Iwan's Split Handle (Eureka)
4-ft. Handle...per doz. $14 00
7-ft. Handle...per doz. 36 00
Iwan's Hercules pattern, per doz. 14 90

DRILLS.

V. & B. Star, 12-inch Length.
¼, 5/16 and ⅜, each....$ 25
⅜, each 36
1, each 54
1¼, each 81
V. & B. Star, 18-inch Length.
5/16 and ⅜, each.....$ 33
⅜, each 45
1, each 69
1¼, each 1 05

EAVES TROUGH.

Milcor .....
Galv. Crimpedge, crated...70-5%

ELBOWS—Conductor Pipe.

Milcor .....
Galv., plain or corrugated, round flat.
Crimp, Std. gauge.....60%
26 Gauge Std. gauge.....40%
24 Gauge Std. gauge.....10%

Square Corrugated.
Milcor .....
Standard gauge 45%
26 gauge 30%

Portico Elbows.
Standard Gauge Conductor Pipe, plain or corrugated.
Not nested .....70 & 5%
Nested solid .....70 & 5%

ELBOWS—Stove Pipe.

1-piece Corrugated. Uniform.

	Doz.
5-inch	$1 45
6-inch	1 60
7-inch	2 10

Special Corrugated.

	Doz.
6-inch	$1 45
7-inch	1 75

Uniform, Collar Adjustable.

	Doz.
5-inch	$2 60
6-inch	2 10
7-inch	2 60

WOOD FACES—50% off list.

FENCE.

Field Fence	60½
Lawn "	53%

FILES AND RASPS.

Heller's (American)	65-5%
American	65-5%
Arcade	60 & 10%
Black Diamond	50-5%
Eagle	60-10%
Great Western	60 & 10%
Kearney & Foot	60 & 10%
McClellan	60 & 10%
Nicholson	50-14%
Simonds	60%

FIRE POTS.

Ashton Mfg. Co.
Complete line Firepots and Torches...52%

Otto Bernz Co.

No. 1 Furn. Gasolene with large shield, 1 gal.	$ 6 75
No. B Furn. Kerosene, 1 gal.	15 12
No. 10 Brazier, Kerosene or Gasolene, 10 gals.	47 52
No. 5 Torch, Gasolene or Kerosene, 1 pt.	7 92
No. 83 Torch, Gasolene, 1 quart	5 40
No. 86 Torch, Gasolene, 1 pt.	4 05

Clayton & Lambert's.
East of west boundary line of Province of Manitoba, Canada, No. Dakota, So. Dakota, Nebraska, Kansas, Oklahoma, Amarillo, San Angelo and Laredo, Texas 52%
West of above boundary line.48%

Geo. W. Diener Mfg. Co.

	Ea.
No. 02 Gasolene Torch, 1 qt.	$ 5 55
No. 0250, Kerosene or Gasolene Torch, 1 qt.	7 50
No. 10 Tinners' Furn. Square tank, 1 gal.	12 60
No. 15 Tinners' Furn. Round tank, 1 gal.	12 00
No. 21 Gas Soldering Furnace	3 60
No. 110 Automatic Gas Soldering Furnace	10 50

Double Blast Mfg. Co.
Gasolene, Nos. 25 and 35...60%

Quick Meal Stove Co.
Vesuvius, F.O.B. St. Louis 30% (Extra Disct. for large quantities)

Chas. A. Hones, Inc.

Buzzer No. 1	$ 9 00
" " 2	12 00
" " 22	13 50
" " 42	15 00
" " 43	19 00

FREEZERS—ICE CREAM.

Peerless and Alaska

1 quart	$2 95
2 quart	3 45
3 quart	4 10

White Mountain

½ quart	$3 50
1 quart	4 90
2 quart	5 70

GALVANIZED WARE.

Pails (Competition), 8-qt.	$2 00
10-qt.	2 25
12-qt.	2 65
14-qt.	3 00
Wash tubs, No. 1	7 00
No. 2	7 25
No. 3	8 00

GARAGE DOOR HARDWARE.
Stanley .....All net

GAUGES.
Marking, Mortise, etc.....Nets

Wire.
Disston's 25%

GIMLETS.
Discount .....65% and 10%

GLASS.
Single Strength, A and B, all sizes .....83 & 85%
Double Strength, A, all sizes 84%

GREASE, AXLE.

Frazers'

1-lb. tins, 36 to case, per case	$ 4 70
3-lb. tins, 24 to case, per case	7 80
5-lb. tins, 12 to case, per case	7 20
10-lb. tins, per dozen	10 40
15-lb. tins, per dozen	13 80
25-lb. tins, per dozen	19 80

HAMMERS, HANDLED.

	Each, net
All V. and B.	
Blacksmiths' Hand, No. 0, 36-oz.	$1 00
Engineers' No. 1, 26-oz.	1 00
Farrier's, No. 7, 7-oz.	93
Machinists', No. 1, 7-oz.	78
Nail.	
Vanadium, No. 41, 20-oz. each	1 45
Vanadium, No. 41½, 16-oz., each	1 45
V. & B., No. 11½, 16-oz. each	1 04
Garden City, No. 111½, 16-oz., each	87
Tinner's Riveting, No. 1, 8-oz., each	82
Shoe, Steel, No. 1, 13-oz., each	65
Tack.	
Magnetic. No. 5, 4-oz., each	72

HAMMERS, HEAVY.

Farrier's	20%
Mason's. Single and Double Face	50%

HANDLES.

Axe.	
Hickory, No. 1....per doz.	4 00
Hickory, No. 2.... "	3 00
1st quality, second growth	6 00
Special white, 2nd growth	5 00
Chisel.	
Hickory, Tanged, Firmer Assorted .....per doz.	55c
Hickory, Socket, Firmer, Assorted .....per doz.	70c
File.....per doz.	$1 20
Hammer and Hatchet.	
No. 1 per doz.	$0 90
Second growth hickory, per doz.	1 50
Soldering.	
Per doz.	$2 40

HANGERS.

Conductor Pipe. Milcor Perfection Wire	25%
Eaves Trough.	
Steel hangers	30%
Triple Twist wire	10%
Milcor Eclipse Wire	20%
Milcor Triplex Wire	15%
Milcor Milwaukee Extension	15%
Milcor Steel (galv. after forming) List plus	12½ %
Milcor Selflock E. T. Wire, List plus	40%

HASPS.
Hinge, Wrought, with staples, Net

HATCHETS.

	Each
V. and B. Supersteel.	
Broad, No. 1, 24-oz.	$1 42
Half, No. 1, 15-oz.	1 25
Half, No. 2, 27-oz.	1 37
Claw, No. 1, 19-oz.	1 31
Flooring, No. 1, 20-oz.	1 43
Shingling, No. 1, 17-oz.	1 20
Lathing, No. 1, 14-oz.	1 20
Lathing, No. 2, 17-oz.	1 25
Vanadium Steel.	
Half, No. 62, 22-oz.	$1 82
Underhill Pattern Lathing, 9 row, 19-oz.	2 29

HINGES.

Heavy Strap, in Bundles.	
4 inch, dozen prs.	$1 12
5 " " "	1 57
6 " " "	1 93
8 " " "	3 21
Extra Heavy T in Bundles.	
4 inch, dozen prs.	$1 74
5 " " "	1 85
6 " " "	2 31
8 " " "	3 9"

HOES.
Garden .....Net

HOOKS.

Box. V. and B. No. 9, each	$0 26
Conductor.	
Milcor	
"Direct Drive" Wrought Iron for wood or brick	15%
Cotton. V. and B. No. 8, each	24
Hay. V. and B. No. 1, each	26
Bar Meat. V. and B. No. 26, ⅝", each	09
V. and B. No. 24, ⅛", each	16
Screw Meat. V. and B. No. 2, per gro.	6 50
Butchers' "S."	
V. and B. No. 6, each	08
V. and B. No. 8, each	11

HOSE.

	Per. Ft.
¾-in. 2 ply molded	9½c to 12¾c
¾-in. cord	8½c to 10c
¾-in. wrapped	13½c

HUMIDIFIERS.

"Front-Rank," Automatic.	
In single lots	50%
In lots of 10 or more	50-5%
In lots of 25 or more	50-10%
Vapor pans, etc., each	50%

IRONS.

Sad.	
Genuine Mrs. Potts, nickel plated, per set	$1 55
Asbestos No. 70, per set.	2 10
Asbestos No. 100, per set.	2 30
E. C. Stearns'.	
No. OA Corner, doz. sets	$2 50
No. OB " " "	2 75

KNIVES.

Butcher.	
Beechwood Handles, 6-inch blade	25%
Beechwood Handles, 7-inch blade	25%
Beechwood Handles, 8-inch blade	25%
Cooper's Hoop	25%
Drawing.	
Standard	25%
Adjustable	25%
Barton's Carpenters'	25%
Hay.	
Iwan's Solid Socket	25%
Heath's	25%
Iwan's Sickle Edge	25%
Iwan's Imp'd Serrated	25%
Hedge.	
Challenge	25%
Disston's No. 1	25%
Putty.	
Common	25%
Lander's	25%
Scraping.	
Beech Handles	25%
Lander's	25%

KNOBS.

Door.	
Mineral .....per doz.	$2 00
Porcelain ..... "	2 00
Jet ..... "	2 00

LADDERS.

Step.	
Common, per ft.	28c
Common, with Shelf, add 10c	
IXL	34c
Challenge, 6 to 9 ft.	55c
10 to 16 ft.	60c
Kant-Break, per lineal ft.	75c

LANTERNS.

	Per doz.
Monarch tin, hot blast	$ 8 25
Dietz No. 2, cold blast	13 00
Best tubular	8 25
Competition lanterns No. 0 tubular	6 90

LAWN MOWERS.

12-inch	$5 20
16-inch	5 85
Ball Bearing. 4 blade, adjustable bearing.	
14"	$7 50
16"	7 80

LEATHER BELTING.

From No. 1 Oak Tanned Butts. Extra heavy, 18-oz.	35%
Heavy, 16-oz.	40%
Medium, 14½-oz.	40%
Light, 13-oz.	50%

LEATHER LACING.
Cut, strictly No. 1.....45%

LEVELS.

Disston, No. 28 Asst.	$22 05
" No. 18, 20 in., each	1 83
" No. 22, 24 in., each	2 40
" Shafting, 6 in.	19 80
" " 6 in. gr. glass	24 20
" No. 1 Asst.	5 75
" No. 2 Asst.	12 40
" 24-26 in., each	1 62
" 28-30 in., each	1 00

LIFTERS.

Stove Cover.	
Coppered .....per gro.	$6 00
Alaska ..... "	4 75

LOCKS.

Barn Door.	
No. 60 Stearn's. per doz.	$11 00
No. 80 " "	20 00

MALLETS.

Carpenters'.	
Fibre Head No. 2, per doz.	$12 00
" No. 3, "	15 50
" No. 3½, "	20 50
Round Hickory .....per doz.	$3 00— 5 00
Tinners'. Hickory .....per doz.	$2 25

MATS.

Door.	
National Rigid	5 & 10 & 5%
Acme Steel Flexible	50%

MITRES.

Galvanized steel mitres, and caps, end pieces, outlets	20%
Milcor	
Galv. one piece stamped	40%

MOPS.

Cotton, Star (Cut Ends).				
Pounds	12'	15'	18'	24'-3-oz.
Per doz.	$4 00	4 35	5 50	7 00
Enterprise				16⅔%
Parker				50 & 5%

NAILS.

Cut Steel	$4 70
Cut Iron	4 70
Wire. Common	2 80
Cement Coated. Small Lots	2 30

NETTING, POULTRY.

Galvanized before weaving	45-10%
Galvanized after weaving	45%

NIPPERS.

Nail Cutting. V. & B. No. 30	78c
Double Duty. V. & B. No. 60	76c
Hoof.	
Heller's	40 & 10%
V. & B. No. 52, each	$2 25

NOZZLES.

Hose.	
Magic .....per doz.	$9 50
Diamond ..... "	5 75

OILERS.

Chase Pattern.	
Brass and Copper	10%
Zinc Plated	40 & 5%
Railroad.	
Brass	20 & 5%
Coppered	50 & 5%
Steel. Copper Plated	70 & 5%

OPENERS.

Delmonico .....per doz.	$1 20
Never Slip ..... "	65
Crate. V. & B...per doz.	$7 25—11 00

How It Works Out For You

One

FIRST THERE ARE the rain shower and the leaks, old and new, in leaders, gutters and around flashings and the Homeowner's Nth resolve to do something about it—which he may or may not, his action often depending on what reminder he receives. There are many such situations in the territory of every sheet metal contractor.

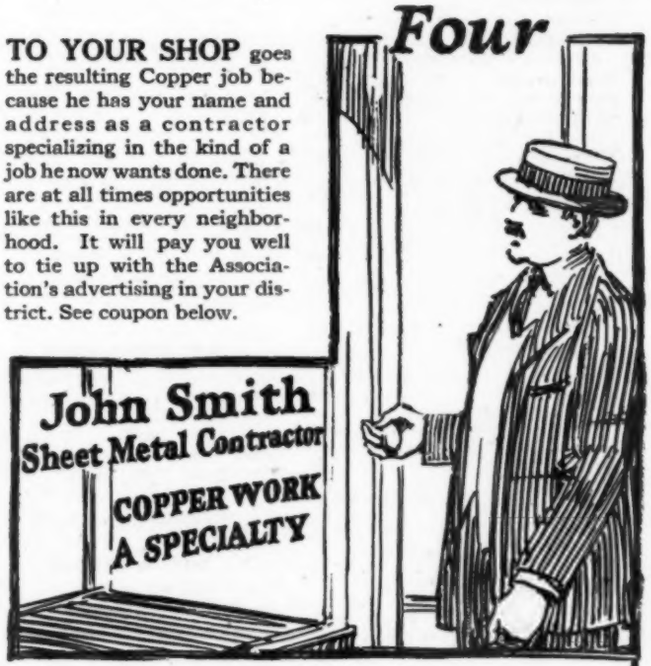
Two

THEN COMES one or more of the Copper & Brass Research Association's frequent advertisements in the Homeowner's newspaper or favorite magazine, pointing out the non-rusting and everlasting qualities of Copper for all roofing purposes and how Copper will save him the unsightly damage done to his home by leaking gutters, leaders and flashings.

Three

HE NEEDS NOW only the convenient address of a sheet metal contractor specializing in Copper work. That is where YOU come in—when he receives from you a copy of the Copper & Brass Research Association's latest pamphlet, "Rust-Proofing Home Sweet Home," with "Compliments of" and your name and address imprinted thereon.

Four



TO YOUR SHOP goes the resulting Copper job because he has your name and address as a contractor specializing in the kind of a job he now wants done. There are at all times opportunities like this in every neighborhood. It will pay you well to tie up with the Association's advertising in your district. See coupon below.

Let Us Help You Sell Copper

COPPER & BRASS
RESEARCH ASSOCIATION

25 Broadway - New York

COPPER & BRASS RESEARCH ASSOCIATION
25 Broadway, New York

A. A.

Please send me, without charge.....copies of the pamphlet "Rust-Proofing Home Sweet Home," with my name as a sheet metal contractor imprinted (also free) as follows:

Name_____

Street address_____

City or State_____

PAILS.

Cream.
14-qt. without gauge, per doz. $9 50
18-qt. without gauge, per doz. 11 00
20-qt. without gauge, per doz. 11 75

Sap.
10-qt., IC Tin....per doz. $4 00
12- " " " " 5 50

Stock.
Galv. qts. 14 16 18 20
Per doz. $9 75 10 75 12 75 14 50

Water.
Galvanized qts. 10 12 14
Per doz. $5 75 6 50 7 25

PASTE

Asbestos Dry Paste:
200-lb. barrel $15 00
100-lb. barrel 8 00
35-lb. pail 3 25
10-lb. bag 1 00
5-lb. bag 55
2½-lb. cartons 30

PINCERS.

All V. & B.
Carpenters', cast steel,
No..... 6 8 10 12
Each $0 43 $0 52 $0 61 $0 71
Blacksmiths', No. 10.....$0 64

PIPE.

Conductor.
"Interlock" Galvanized.
Crated and nested (all gauges) 60-7½%
Crated and not nested (all gauges) 60-2½%
Square Corrugated A and B and Octagon.
29 Gauge 60-10%
28 " 60-10%
26 " 60-10%
24 " 60-10%

"Interlock."
Crated and nested (all gauges) 60-7½%
Prices for Galvanized Toncan Metal, Genuine O. H. Iron, Lyonmore Metal and Keystone C. B. on application.

Stove. Per 100 joints.
26 gauge, 5 inch E. C. nested $16 00
26 gauge, 6 inch E. C. nested 17 00
26 gauge, 7 inch E. C. nested 19 00
28 gauge, 5 inch E. C. nested 14 00
28 gauge, 6 inch E. C. nested 15 00
28 gauge, 7 inch E. C. nested 17 00
30 gauge, 5 inch E. C. nested 13 00
30 gauge, 6 inch E. C. nested 14 00
30 gauge, 7 inch E. C. nested 16 00
T-Joint Made up, 6-inch..... per 100 $40 00

Furnace Pipe.
Double Wall Pipe and Fittings 33⅓%
Single Wall Pipe, Round Pipe Fittings 33⅓%
Galvanized and Back Iron Pipe, Shoes, etc...33⅓%
Milcor Galvanized 40%

PLANES.

Stanley Iron Bench.....Net

PLIERS.

(V. & B.)
Nut, No. 3, each.....$2 60
" No. 5, each..... 64
" No. 25, each..... 69
Gas, No. 7, each..... 55
" No. 8, each..... 61
" No. 12, each..... 87
Lining or Crimping.
No. 35, each..... 64
Button's Pattern.
No. 6 each..... 61
No. 8 each..... 74
Double Duty, No. 106..... 50

POINTS, GLAZIERS'.

No. 1, 2 and 3..per doz. pkgs. 65c

POKERS, STOVE.

Wr't Steel, str't or bent, ... per doz. $0 75
Nickel Plated, coil handles ..... " 1 10

POKERS, FURNACE.

Each $0 50

PULLEYS.

Furnace Tackle.....per doz. $0 60
Per gross 6 00
" Screw (encased) ...per doz. $0 85
Ventilating Register.
Per gross $9 00
Small, per pair..... 0 30
Large, per pair..... 0 50

PUNCHES.

Machine.	Each.
V. & B., No. 11-13, 1⅛x6..$0 19	
V. & B., No. 90, ⅝x9.....	27
V. & B., No. 10, ¾x10....	29
V. & B., No. 1-6, ½x6....	12

Center.
V. & B., No. 50, ⅝x4.....$0 14
Belt.
V. & B., No. 101-103.....$0 24
V. & B., No. 108-109..... 33
V. & B., No. 25, ass't..... 3 80

Samson Line.
No. 1 Hand { Doz. lots or less 40%
No. 2 Hand { 3 doz. lots ...Less 40 & 5%
No. 4 Hand { 6 doz. lots or more...Less 50%
No. 3 Bench { Less than doz. lots...Less 25% / Doz. lots or more...Less 40%

Extra Punches and Dies for Samson:
No. 1 Hand { Less than doz. lots....Less 25%
No. 2 Hand { Doz. lots, ...Less 33⅓%
No. 4 Hand { 3 doz. lots, ...Less 40%
No. 3 Bench { 6 doz. lots or more, ..Less 40 & 10%

PUTTY.

Commercial Putty, 100-lb. kits $3 65

QUADRANTS.

Malleable Iron Damper.....10%

RAZORS—SAFETY.

Gillette .....per doz. $45 00
Auto Strop ..... " 45 00
Gem ..... " 3 40
Gem (3 doz. lots).. " 3 00
Every Ready ..... " 3 40
Ever Ready (3 dz. lots) " 3 00

RAZORS STRAIGHT.

RAZOR STROPS.

Star (Honing) 50%

FLOOR REGISTERS AND BORDERS.

Cast Iron 20%
Steel and Semi-Steel.....33⅓%
Baseboard 33⅓%
Adjustable Ceiling Ventilators 33⅓%

Register Faces—Cast and Steel
Japanned, Bronzed and Plated.
4x6 to 14x14.....33⅓%
Large Register Faces—Cast, 14x14 to 38x42.....60%
Large Register Faces—Steel, 14x14 to 38x42.....65%

ROOFING.

	Per Square
Best grade, slate surf. prep'd	$1 85
Best talc surfaced.....	2 20
Medium talc surfaced.....	1 50
Light talc surfaced.....	95
Red Rosin Sheeting, per ton	$72 00

ROPE.

Cotton.
Sisal.
1st Quality, base 14½c to 16½c
No. 2 .....13½c to 15c
Manila.
1st Quality standard brands .....18½c to 20½c
No. 2 .....17c to 18½
Hardware Grade, per lb. 17½c

SAWS.

Butchers'.
Atkins No. 2, 14-in.....$12 75
" No. 2, 18-in..... 14 30
" No. 7, 16-in..... 15 85
" No. 2, 22-in..... 15 92
" No. 7, 20-in..... 18 05
" No. 7, 24-in..... 20 20
" No. 7, 28-in..... 22 35

Compass.
Atkins No. 2, 10-in.....$ 5 45
" No. 10, 10-in..... 5 60
" Blades, No. 2, 10-in. 3 25
" " No. 2, 10-in. 3 30

Cross-Cut.
Atkins No. 221, 4 ft.....$3 03
" No. 221, 6-ft..... 4 45
" No. 221, 8-ft..... 6 07

Hand.
Copper Burrs only.....30%
" No. 96, 20-in..... 21 70

Hand and Rip.
Atkins No. 54, 20-in.....$19 50
" No. 54, 26-in..... 24 40
" No. 53, 16-in..... 18 10
" No. 53, 20-in..... 22 90
" No. 53, 24-in..... 26 60
" No. 53, 28-in..... 31 45
" No. 53, 30-in..... 34 15

Keyhole.
Atkins No. 1, complete.. $3 10
" No. 2, complete.. 3 70

Miter Box.
Atkins No. 1, 4x20.....$32 65
" No. 1, 5x22..... 38 00
" No. 1, 6x22..... 42 20

Pruning.
Atkins No. 20, 12-in.... $ 8 45
" No. 10, 16-in.... 18 15

Wood.
Atkins No. 202.....$ 7 19
" No. 318..... 8 75
" No. 906..... 15 50
" No. 1509..... 16 56

SCRAPERS.

Box.
No. 6, six blades each.... 25c
Hog.
No. 6, each..... 25c
Floor (Stearns).
No. 10, each.....$11 50

SCREEN DOOR HINGES.

Cast Iron .....gross $13 00
Steel ..... " 9 50

SCREWS.

Wood.
F. H. Bright 80%
R. H. Blued 78%
F. H. Jap'd 74%
F. H. Brass 76%
R. H. Brass 74%

Sheet Metal.
No. 7, ½x ½, per gross.$0 55
No. 10, ¾x3/16, per gross. 75
No. 14, ⅞x ¼, per gross. 90

SCREW DRIVERS.

Uncle Sam Standard Head.
3 inches, each.....$ 45
5 inches, each..... 52
8 inches, each..... 68
12 inches, each..... 1 02

Uncle Sam Insulated Head.
3 inches, each.....$ 49
5 inches, each..... 57
8 inches, each..... 76
12 inches, each..... 1 14

SETS.

Nail.
V. & B.
No. 100, in cardboard boxes .....doz. $1 55
No. 100, in wooden boxes, ... doz. 1 55
No. 30, assorted.....doz. 39
No. 5, in cardboard boxes, ... doz. 1 35
No. 5, in wooden boxes, ... doz. 1 30
Rivet.
V. & B.
Farmers' $0 19
Tinners' 3-4 ..... 0 40
" 00-0..... 0 60
Saw.
Atkins No. 10....per doz. $3 80
" No. 12.... " 6 20

SHEARS.

Nickel Plated, Straight,	Per Doz.
6"	$12 90
7"	14 85
8"	16 80
Japanned, Straight ....6"	11 00
....7"	12 40
....8"	13 80

SHEARS, TINNERS' & MACHINISTS'.

Viking $22 00
Lennox Throatless.
No. 18 .....35%
Shear blades.....10%
(f.o.b. Marshalltown, Iowa.)
Peerless Steel Squaring.
Foot Power.
No. 1—30", 18 ga. cap.....15%
No. 2—36", 18 ga. cap.....15%
No. 4—52", 18 ga. cap.....15%
No. 10—120", 22 ga. cap...15%
No. 4A—52", 16 ga. cap....15%
Cast Iron Foot Power.
No. 01, 30", 18 ga. cap....15%
Power Driven.
(No. 100 Series, 2 Shaft Drive.)
No. 142—42", 18 ga. cap....15%
(No. 200 Series, 2 Shaft Underneath Drive.)
No. 242—42", 14 ga. cap...15%
(No. 300 Series, 3 Shaft Underneath Drive.)
No. 342—42", 10 ga. cap....15%
No. 372—72", 10 ga. cap....15%
(No. 500 Series, 3 Shaft Underneath Drive.
No. 596—96", 10 ga. cap...15%
(No. 600 Series, 3 Shaft Underneath Drive.)
No. 6120—120", 3/16" cap..15%

SHINGLES.

	Per Square
Zinc (Illinois)	$18 00

SHOES.

Milcor.
Galv. Std. Gauge, Plain or corg. round flat crimp...60%
26 gauge round flat crimp..40%
24 gauge round flat crimp..10%
Conductor 60%

SHOVELS AND SPADES.

Coal.
Hubbard's.

No.	A	B	C	D
1	$16 00	15 10	14 45	13 70
2	16 35	15 60	14 85	14 10
3	16 75	16 00	16 25	14 45
4	17 10	16 35	16 60	14 85

Post Drains & Ditching.
Hubbard's.

Size	A	B	C
14"	$17 15	$16 40	$15 65
16"	17 50	16 75	16 00
18"	17 85	17 10	16 35
20"	18 20	17 45	16 70
22"	18 55	17 80	17 05

Alaska Steel.
D-Handle .....per doz. $3 50
Long Handle ..... " 3 00

SIFTERS.

Genuine Hunters, doz.....$2 50

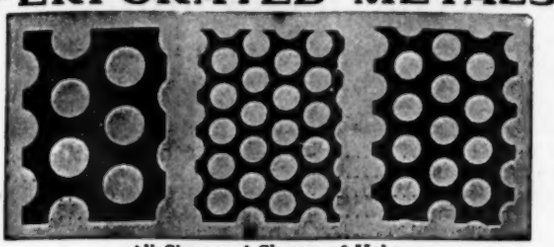
SKATES.

Ice, Men's and Boys'.

	Per Pair
Key Clamp—rocker—bright finish .....$	76
Key Clamp—rocker—nickel finish	1 10
Key Clamp—rocker — pol. steel	1 36
Key Clamp—Hockey	1 38
Skate outfits	4 75

Women's and Girls'.
½ Key Clamp—rocker....$1 31
" " " hockey .. 1 38
Ice Skate outfit 5 00
Roller.
Ball Bearing—Boys' $1 55
Ball Bearing—Girls' 1 65

PERFORATED METALS



All Sizes and Shapes of Holes
In Steel, Zinc, Brass, Copper, Tinplate, etc.
For All Screening, Ventilating and Draining
EVERYTHING IN PERFORATED METAL

THE HARRINGTON & KING PERFORATING CO.
• 610 NORTH UNION ST.—CHICAGO, ILL., U. S. A. •
• NEW YORK OFFICE 114 LIBERTY ST. •

SOFT

The deciding word in the *SHEET METAL SHOP*

Inland Sheets

are soft and workable

Inland Copper Alloy Quality

insures longer life

INLAND STEEL COMPANY
38 South Dearborn St., Chicago

Works:
Indiana Harbor, Ind.
Chicago Heights, ILL.

Branch Offices
Milwaukee St. Louis
St. Paul

They are standing on

KANT-BREAK LADDERS

KANT-BREAK Ladders are being used by thousands of sheet metal contractors throughout the states **because**

They are

SAFE
DURABLE
LIGHTWEIGHT
ECONOMICAL

and they

KANT-BREAK

THERE'S a ¼-inch steel rod through the center of each rung firmly bolted to the sides.

There's a No. 7 Bessemer tinned steel wire grooved in on both sides of the rails, countersunk at both ends.

It's the only ladder of its kind on the market—order yours now.

KANT-BREAK LADDERS, Inc.
Ninth and Monroe Streets
ST. LOUIS, MO.

Write for catalogs and prices today.

CORTRIGHT METAL SHINGLES

Cortright hand-dipped shingles are first stamped out of prime roofing tin. After this they are immersed in a bath of molten zinc and receive a uniform coating on both sides and on all edges.

We also make shingles stamped from tight-coat galvanized sheet and from tin plate. We paint these either red or green.

CORTRIGHT METAL ROOFING CO.
Philadelphia — Chicago

SNIPS, TINNERS'.

Clover Leaf .....40 & 10%
National .....40 & 10%
Star 50%
Milcor .....Net

SQUARES.

Steel and Iron.....Net
(Add for bluing, $3.00 per doz. net)
Mitre ..... "
Try ..... "
Try and Bevel..... "
Try and Mitre..... "
Fox's .....per doz. $6 00
Winterbottom's 10%

STAPLES.

Blind.
Barbed .....per lb. 21@22c
Butter, Tub..... " 16@19c
Fence—
Polished .....per 100 lbs. $5 45
Galvanized ... " 6 15
Netting.
Galvanized ...per 100 lbs. $6 54
Wrought.
Wrought Staples, Hasps and Staples, Hasps, Hooks and Staples, and Hooks and Staples .....50 & 10%
Extra heavy 35%

STONES.

Axe.
Hindostan .... per lb. New Nets
More Grite .... " "
Washita ..... " "
Emery.
No. 126.....per doz. New Nets
Oil—Mounted.
Arkansas Hard
No. 7.....per doz. New Nets
Arkansas Soft. " "
Washita No. 717 " "
Oil—Unmounted.
Arkansas Hard per lb. New Nets
Arkansas Soft. " "
Lily White.... " "
Queer Creek... " "
Washita ..... " "
Scythe.
Black Diamond per gro. New Nets
Crescent ..... " "
Green Mountain " "
LaMolle ..... " "
Extra Quinnebog ..... " "
Red End ..... " "

STOPS, BENCH.

No. 10 Morrill pattern .....per doz. $11 00
No. 11 Stearns pattern ..... " 10 00
No. 12 Smith pattern ..... " 7 00

STOPPERS, FLUE.

Common .....per doz. $1 10
Gem, No. 1..... " 1 10
Gem, flat, No. 2... " 1 00

STRETCHERS.

Carpet.
Bullard's .....per doz. $3 90
Excelsior ..... " 5 25
Malleable Iron.... " 70
Perfection ..... " 6 30
King ..... " 4 50
Wire.
O. S. Elwood, No. 1 per doz. Nets
O. S. Elwood, No. 2, " "

SWIVELS.

Malleable Iron.....per lb. $0 10
Wrought Steel.....per gro. 4 50

TACKS.

Bill Posters' 6-oz. 25-lb. boxes per lb. 15c
Upholsterers' 6-oz., 25-lb. boxes, per lb.....15½c

TAPES, MEASURING.

Asser' Skin .....List & 40%

THERMOMETERS

Tin Case...per doz. 80c & $ 1 25
Wood Backs " $2 00 & 12 00
Glass ..... " 12 00

TIES.

Bale.
Single Loop, carload lots .....75 & 7%
Single Loop, less than car lots .....70 & 15%

TRAPS.

Mouse and Rat.	Per Gross.
Sure Catch Mouse Traps.	$ 2 10
Vim Mouse Traps.....	2 10
Short Stop Mouse Traps.	1 80
Wood Choker Mouse Traps, 4 hole.....	10 25
	Per Doz.
Sure Catch Rat Traps....	$0 90
Dead Easy Rat Traps....	1 00

Baskets.
Packed in One Bushel Band Stave List per Bushel.

Sure Catch Mouse Traps (360 Traps)	$ 5 25
Short Stop Mouse Traps (360 Traps.).....	4 50
Sure Catch Rat Traps (54 Traps)	3 60
Short Stop Rat Traps (54 Traps)	3 15

Assorted Mouse and Rat Traps. List per Bushel.

Sure Catch (216 Mouse Traps and 26 Rat Traps)	$4 90
Short Stop (216 Mouse Traps and 26 Rat Traps)	4 25

TROWELS.

Cement.
Atkins No. 6.....$19 50
" No. 9..... 25 50

TWINE.

White Cotton.
Eureka, 4-ply.....per lb. 30c
Jute.
3-ply and 6-ply Bale Lots 22½c

VALLEY.

Milcor .....
Galv. formed or roll.....50-7½%

VENTILATORS.

Standard.....30 to 40%

VISES.

No. 700 Hand, Inches	4½	5	5½
Doz.	$11 15	13 00	14 85
No. 701. In.	4	5	6
Doz.	$11 15	13 00	16 70

No. 1, Genuine Wentworth, Noiseless Saw...per doz. 9 25
No. 3, Genuine Wentworth, Noiseless Saw....per doz. 12 75
No. 500, All Steel Folding Saw .....per doz. 16 00

WASHERS.

Over ½ in. barrel lots per 100 lbs.....$6 25
Iron and Steel.

In.	5/16	⅜	½	⅝	¾
	10¼c	9¼c	7¾c	7½c	7 2/3c

WEATHER STRIPS.

Metallic Stitched.
½ in., per 100 ft.....$1 80
¾ in., per 100 ft..... 2 20
Wood and Felt.
⅝ in., per 100 ft.....$1 56
⅞ in., per 100 ft..... 1 56

WEIGHTS.

Hitching .....per lb. Nets
Sash—f. o. b. Chicago
Smaller lots, per ton....$47 50

WHEEL BARROWS.

Common Wood Tray.....$3 75
Steel Tray, Competition.... 4 50
Steel leg, garden..... 6 00

WIRE.

Plain annealed wire, No. 8 per 100 lbs. $3 70
Galvanized barb wire, per 100 lbs. 4 10
Wire cloth—black painted, 12-mesh, per 100 sq. ft... 2 35
Cattle Wire—galvanized catch weight spool, per 100 lbs. 4 60
Galvanized Hog Wire, 80 rod spool, per spool..... 3 98
Galvanized plain wire, No. 9, per 100 lbs..... 4 15
Stove Pipe, per stone..... 1 10

WOOD FACES.

50% off list.

WRENCHES.

Coes Steel Handle,	6-in.	40-10%
" " "	8-in.	40-10%
" " "	10-in.	40-10%
" " "	12-in.	40-10%
Coes Knife-Handle,	6-in.	40-10%
" " "	8-in.	40-10%
" " "	10-in.	40-10%
" " "	12-in.	40-10%

Coes All Patterns.....40-10%

WRINGERS.

No. 790, Guarantee per doz.		$49 50
No. 770, Bicycle ...	"	47 00
No. 670, Domestic..	"	42 50
No. 110, Brighton...	"	39 00
No. 750, Guarantee..	"	51 00
No. 740, Bicycle....	"	48 50
No. 22, Pioneer....	"	35 50
No. 2, Superb.....	"	25 50

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